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EPA Region 5 Records Ctr. 230988

December 10, 2002

VIA FIRST CLASS MAIL

Mr. Bernard Schorle (HSRL-6) Waste Management Division U. S. EPA Region V 77 West Jackson Blvd. Chicago, IL 60604

Subject:

Report of Water Quality Conditions, Third Quarter 2002

Marion (Bragg) Landfill, Marion, Indiana

Dear Mr. Schorle:

On behalf of the Marion (Bragg) Group, please find enclosed three (3) copies of the Report of Water Quality Conditions for the third quarter of 2002, prepared by O&M, Inc.. for the subject site.

Please contact me at (630) 443-1940 with any questions on the enclosed reports.

Sincerely.

de maximis, inc.

Enclosures

Resa Ramsey, IDEM (cover plus one copy) cc:

John Hanson, Esq., Beveridge & Diamond, P.C. (cover plus one copy)

Rick Meyers, United Technologies (cover plus one copy)

Dan Garrigan, O&M Inc. (cover via facsimile only)

FILE: 3004-18\3rdqtr 2002rpt.doc

REPORT OF

WATER QUALITY CONDITIONS THIRD QUARTER 2002 MARION (BRAGG) LANDFILL

MARION, INDIANA

Prepared on Behalf of:

MARION (BRAGG) LANDFILL GROUP

Prepared by:

O & M, Inc. 303 N. Indiana St. Danville, IN 46122

NOVEMBER 2002

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1.0 INTRODUCTION

This report presents water level data, field water quality measurements and results of laboratory analyses for water samples collected at the Marion (Bragg) Landfill site during the semi-annual monitoring event conducted in September 2002. The monitoring program was designed to document the effectiveness of the landfill cap and is described in detail in the Remedial Action Plan (RAP) (Environmental Resources Management (ERM), 1989, Remedial Action Plan, Marion (Bragg) Landfill Site, Marion, Indiana) and Remedial Design/Remedial Action (RD/RA) Work Plan (Environmental Resources Management, 1989, Remedial Design/Remedial Action Work Plan, Marion (Bragg) Landfill Site, Marion, Indiana).

This sampling event continues to implement a condensed monitoring program after the U.S. Environmental Protection Agency (USEPA) issued a no-further-action Record of Decision for this site. Over Eleven (11) years of monitoring data had been collected, since the start of the monitoring program in January 1990.

With concurrence of the USEPA, the number of sampling locations and parameters has been reduced. Monitoring has been reduced to the following locations: for ground water, MB-1, MB-2, MB-5, MB-6, MB-7, MB-8, MB-9, and MB-10, and for surface water, PW-1, SW-1, SW-5, and SW-6.

The sampling program consisted of sampling the on-site monitoring wells (MB-1, -2, and -5 through -10), the on-site pond (PW-1), the Mississinewa River (SW-1 and SW-5), and Lugar Creek (SW-6) for the Target Compound List (TCL) semi-volatiles, Target Analyte List (TAL) metals (dissolved fraction), and the project specific indicator parameters, total suspended solids (TSS), ammonia-nitrogen (NH₃-N), chemical oxygen demand (COD), and chlorides (CI). Selected locations of MB-1, MB-2, and SW-1 are sampled for Target Compound List (TCL) volatiles. These parameters and locations

are sampled two (2) times per year. Field parameters (temperature, pH, specific conductance, and dissolved oxygen) are collected at each of the stated sampling locations.

Water quality sampling at the Marion (Bragg) Landfill for the referenced period was performed on September 17th and 18th, 2002. All sampling and analyses were conducted in compliance with the requirements specified in the RD/RA Work Plan (ERM, 1989) and Quality Assurance Project Plan (ERM, 1990, Quality Assurance Project Plan, Remedial Design/Remedial Action, Monitoring and Additional Studies at the Marion (Bragg) Landfill Site, Marion, Indiana).

Copies of the chain-of-custody forms are included in Appendix A and the data validation report is included in Appendix B. Questions regarding specific analytes, concentrations, or qualifiers are addressed in the data validation report.

2.0 SITE CONDITIONS

Sampling event data is presented in attached Tables 1 through 12 and Figures 1 through 7. Review of that data indicates:

- The interpreted groundwater flow directions are the same as presented in previous reports.
- The water levels in wells, ponds, and river continue to follow seasonal trends (Figures 4 to 7). The water level in Monitoring Well (MW-8) was not measured due to obstruction in well. O&M Inc. unsuccessfully attempted to remove blockage and secured with new lock.

- No methane was detected at any site monitoring locations.
- Calculated concentrations of un-ionized ammonia exceeded the chronic aquatic criteria (CAC) in groundwater samples at downgradient locations, MB-2, MB-5, MB-6, MB-7, MB-8 and MB-9. (Table 10). However, after applying the mixing calculation, the concentrations were evaluated as being below the CAC (Table 12).
- The TCL volatile, trichloroethene, was detected in the groundwater sample from the on-site monitoring well, MB-1, at a concentration that exceeds the drinking water Maximum Contaminant Levels (MCLs). However, after applying the mixing calculation, the concentrations were evaluated as being below these criteria (Table 12).
- The TAL metals (dissolved), arsenic and iron were detected in groundwater samples from on-site monitoring wells MB-1, MB-2, MB-5, MB-6, MB-7, MB-8 and MB-9 at concentrations which exceeded the appropriate water quality criteria. However, after applying the mixing calculation, the concentrations dropped below the criteria (Table 12).

3.0 COMMENTS

The following general comments are provided regarding sampling procedures, sample documentation, and the data validation report:

- The data validator noted that the sample PW01PB was not recorded on either COC included in the data package. The COC with PW01PB was faxed and sent to the laboratory via mail on 9/20/02.
- The data valiator noted two copies of COC #061476 included in the data package. The first copy of this COC is the one sent with the samples, the second copy was a corrected one faxed to the laboratory on 9/19/02.
- The data validator noted that VOCs were not specified on the COC for samples SW01PB and SW01DPPB. The previously mentioned second copy of the COC #061476 (corrected) is the result.
- The data validator noted that the pH of the samples were not recorded on the COC upon receipt at the laboratory. The pH of the samples are recorded on the commercial receiving logs attached in Appendix A.
- A copy of the courier airbill is attached to this report as Appendix C
- The data validator noted that matrix spike and matrix spike duplicate (MS/MSD) samples should <u>not</u> be recorded on the COC forms as separate samples, but that extra sample volume should be obtained for the analysis. The sample numbering procedures specified in the Quality Assurance Project Plan (QAPP) calls for the use of a suffix added to distinguish additional sample volumes obtained for MS/MSD analysis. This procedure has been used for all sampling events to date and has proven satisfactory. O&M, Inc. will continue to follow the sample numbering and COC procedures specified in the QAPP until instructed otherwise.

FIGURES

Figure 1. Site Location
Marion (Bragg) Landfill

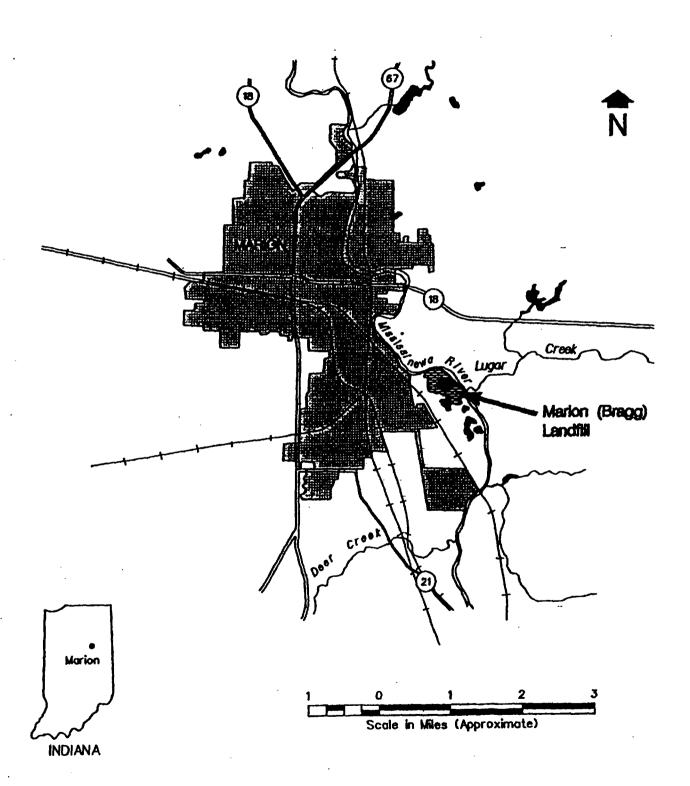


Figure 2 Sampling Locations Marion (Bragg) Landfili

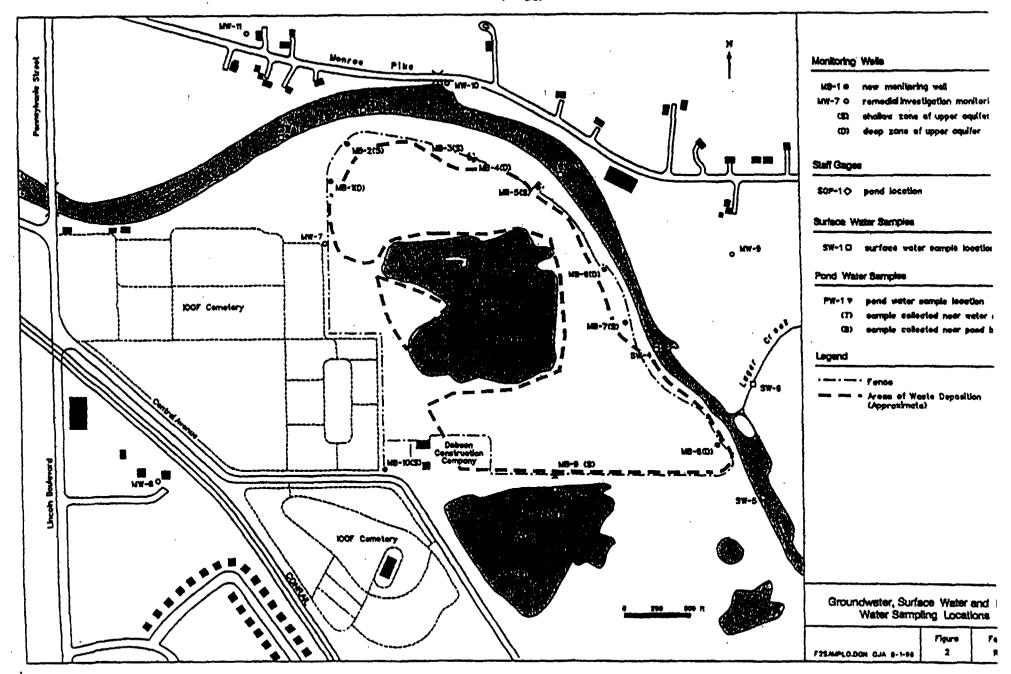
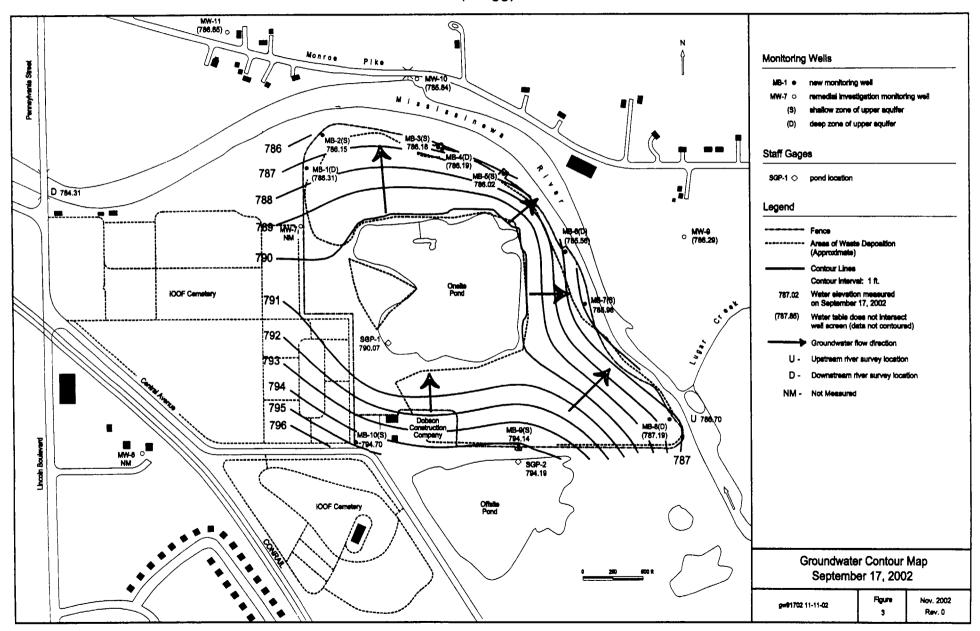
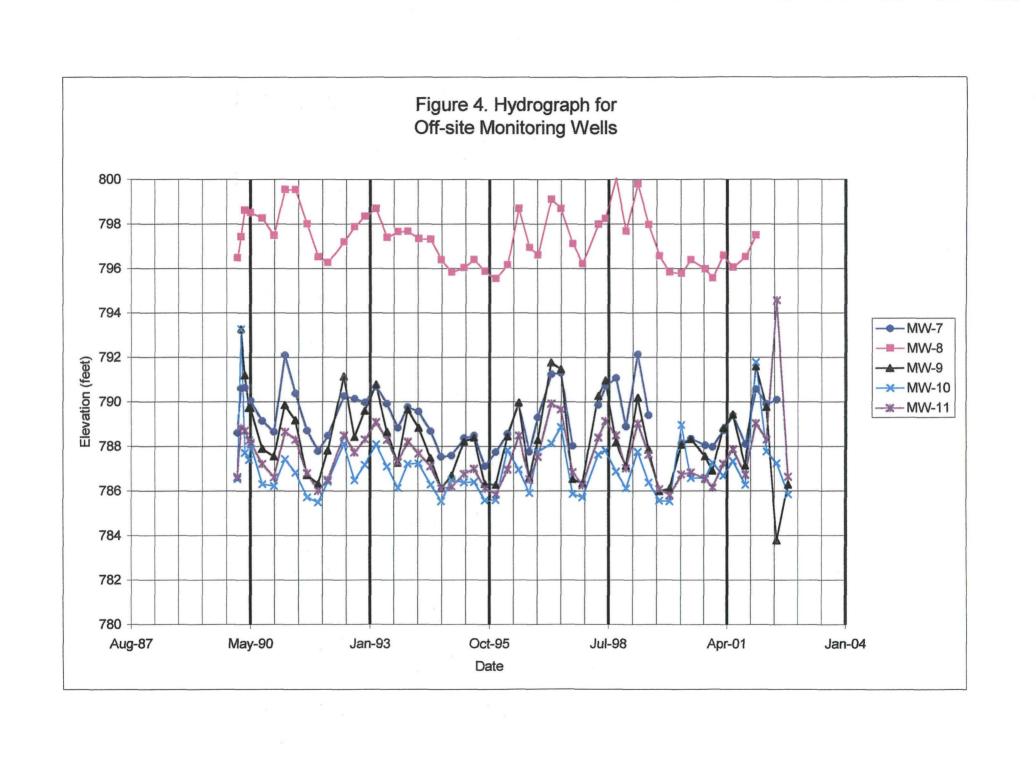
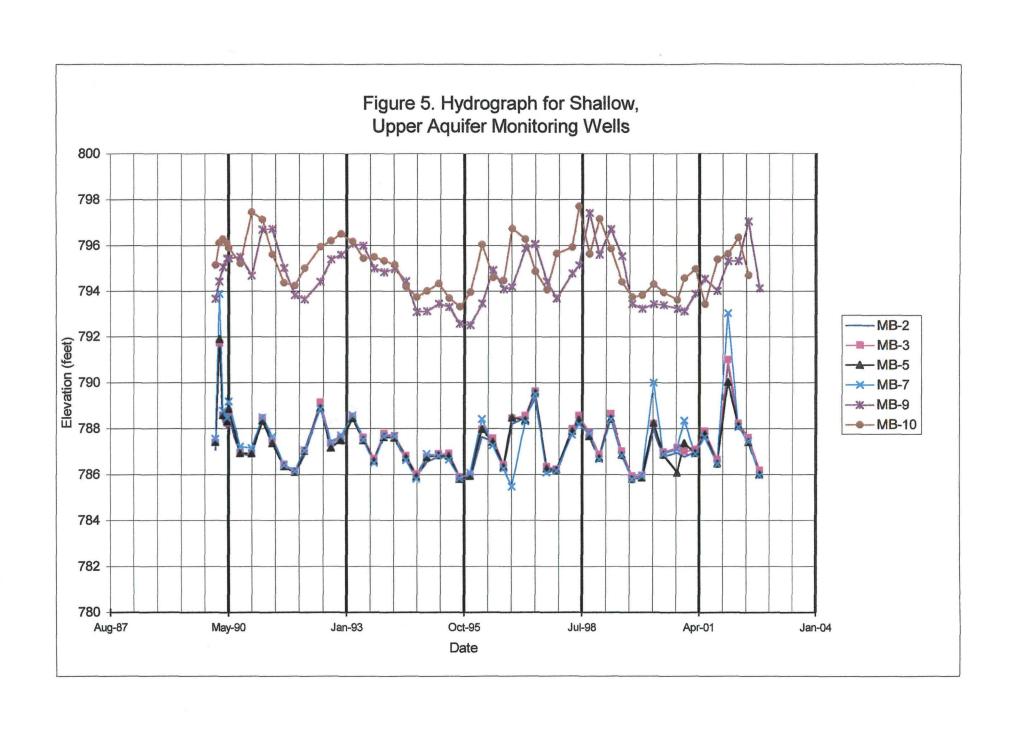
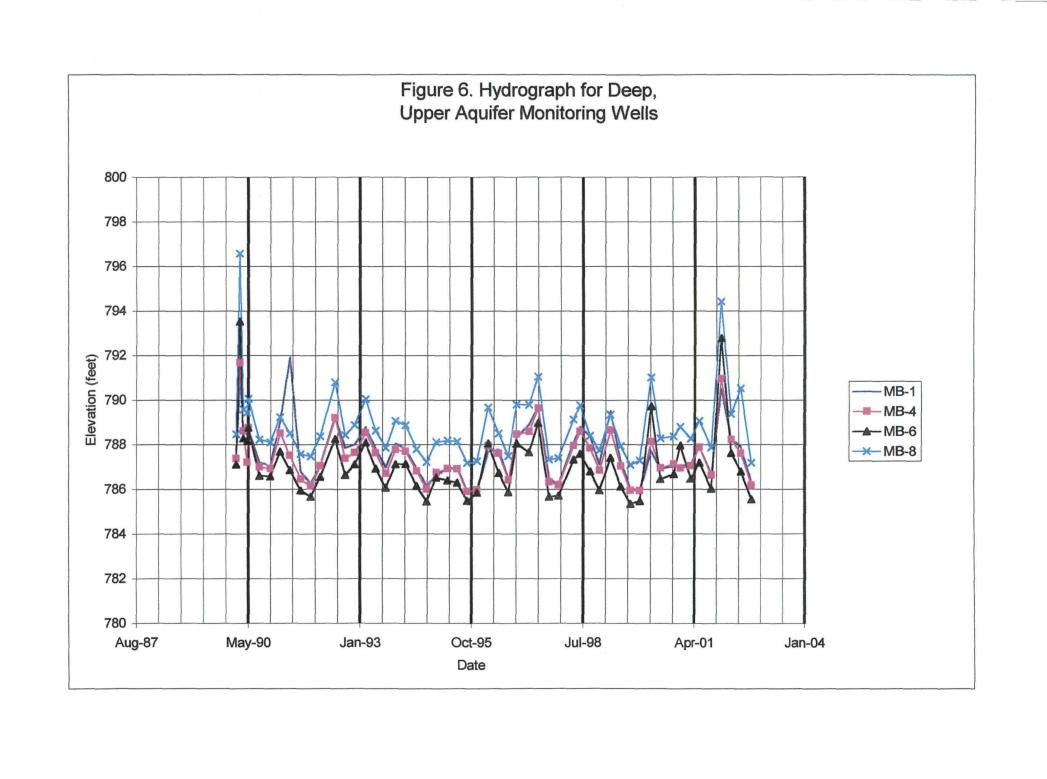


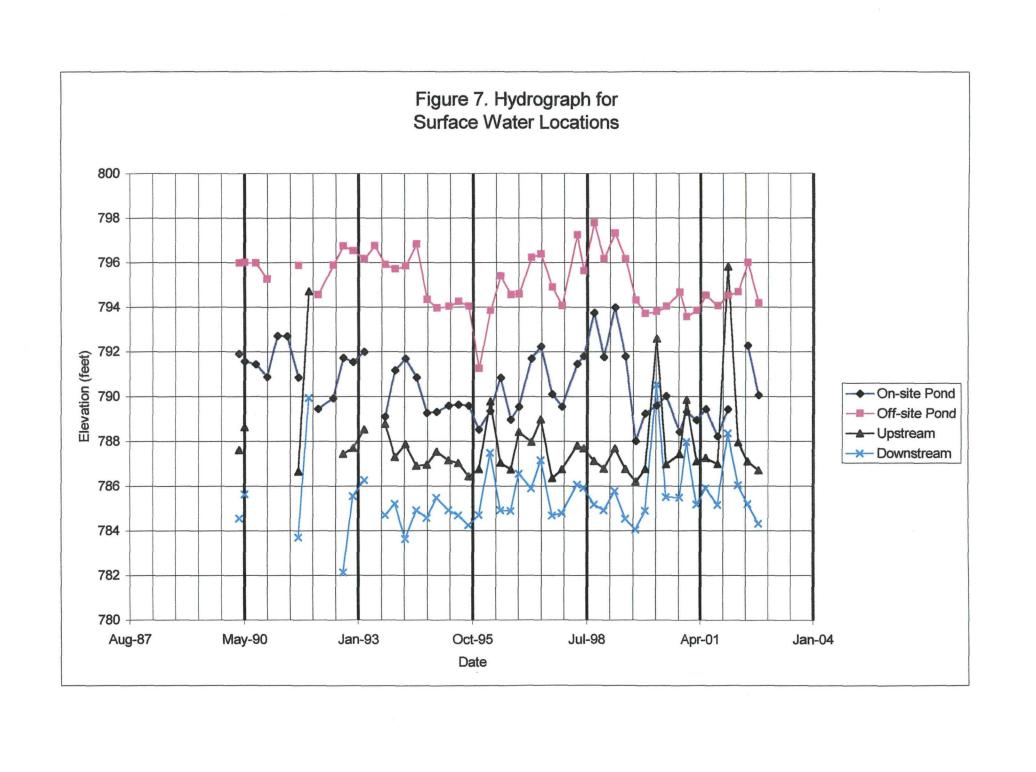
Figure 3 Groundwater Contour Map Marion (Bragg) Landfill











TABLES

Table 1
SAMPLE SUMMARY MATRIX - MARION (BRAGG) LANDFILL

Metrix	Number of Samples	Number of Trip Blanks*	Number of Field Blanks*	Number of Field Duplicates	Number of Matrix Spike/ Matrix Spike Duplicate Samples **	Total Matrix	Analysee	Container and Preservation	Halding Times
	- · · -						LABORATORY		
GROUND WATER	B (Note 1) Confirmatory	3	1	1	2	13		2-40 mi screw cap viels w/ Teffon-fined septs. HCl to pH	14 deys
pampies shall be taken during the	guinter following							< 2. Cool to 4 C.	
the sampling event that revealed	the presence of a								
parameter requiring such confirm Bampling is anticipated for 30 years							pH Check	1-40 ml screw cap visis w/ Teflon-lined septs. HCl to pH < 2. Cool to 4 C,	28 days
							TCL BNAs	2-1 liter amber glass w/ Teflon lined enclosure. Cool to 4 C.	7 days until extraction, 40 days
									after extraction.
							Dissolved TAL Metals	Dissolved samples will be field filtered through a 0.45 micron filter prior to preservation. 1-liter plastic HNO3 to pH <2. Cool to 4C.	
							TSS, Chloride, NH3-N	1-liter pleatic, Cool to 4C	3 days (TS8) 26 days (CI) 28 days(NH3-N)
							cop	1-250 ml plestic H2SO4 to pH <2. Cool to 4C	28 days
							FIELD	<u> </u>	
							pH, Conductivity D.O. and Temp.	Measure in field to stability before collection.	in field.

Note 1: Wells MB-3 and MB-4 were not sampled this quarter as part of an Interim reduced monitored program following a "No further action" ROD.

^{* -} Trip blanks are required for volatile organic analysis at a frequency of one per cooler shipped containing volatile organic analysis.

^{** -} Triple the volume for groundwater and surface water locations will be collected for matrix spike/matrix spike duplicate analyses at a frequency of one per 20 investigative samples. Inorganic energies will include a single matrix spike and a laboratory duplicate vs. matrix spike duplicate.

Table 1 - Continued SAMPLE SUMMARY MATRIX - MARION (BRAGG) LANDFILL

Metrix	Number of Samples	Number of Trip Blanks*	Number of Field Blanks*	Number of Fleid Duplicates	Number of Matrix Spike/ Matrix Spike Duplicate Samples **	Total Matrix	Analyses	Container and Preservation	Holding Times
	· · · · · · · · · · · · · · · · · · ·						LABORATORY		
SURFACE WATER	4 (Note 1)	3	1	1	2	9	TCL Volaties	2-40 ml screw cap vials w/	14 days
Initial and semiannual sampling.	Confirmatory							Teffon-lined septs. HCl to pH	
campies shall be talen during the	quarter following							< 2. Cool to 4 C.	
popularia tress Bugdure est									
perameter requiring such confirm							pH Check	1-40 mt screw cap visis w/	28 days
Sampling is anticipated for 30 year	irs.)							Teffon-lined septa. HCl to pH < 2. Cool to 4 C.	
							TCL BNAs	2-1 liter amber glass w/ Teffon lined enclosure. Cool to 4 C.	7 days until extraction, 40 days after extraction.
							Dissolved TAL Metals	Dissolved eamples will be field filtered through a 0.45 micron filter prior to preservation. 1-fitter plastic HNO3 to pH <2. Cool to 4C.	
							TSS, Chloride, NH3-N	1-liter plastic, Cool to 4C	3 days (TSS) 28 days (CI) 26 days(NH3-N)
							COD	1-250 ml plastic H26O4 to pH <2. Cool to 4C.	28 days
							PIELD		
							pH, Canductivity D.O. and Temp.	Measure in field to stability before collection.	in fleid.

Note 1: The on-ette pond location of PW-2, off-ette pond locations of PW-3 and PW-4, and river locations of SW-2, -3, and -4 were not sampled this quarter as part of an interim reduced monitored program following a "No further ection" ROD.

^{* -} Trip blanks are required for volatile organic analysis at a frequency of one per cooler shipped containing volatile organic analysis.

^{** -} Triple the volume for groundwater and surface water locations will be collected for metrix spike/matrix spike duplicate analyses at a frequency of one per 20 investigative samples. Inorganic analyses will include a single matrix spike and a laboratory duplicate vs. matrix spike duplicate.

TABLE 2: WATER LEVEL AND METHANE MONITORING DATA, MARION (BRAGG) LANDFILL, SEPTEMBER 17, 2002

	Top of		Ground					
	Chaing		Surface	Methane	٧	Vator	Water	
	Elevation	Stickup	Elevation	Concentr	ntion L	.evel	Elevation	
Monitoring Location	(Terrol)	(111)	(fterroi)	(%)		fbtoe)	(ftamel)	
MB-1	799.57	2.50	797	.07	0.0	13.26		786.3
MB-2	801.75	2.80	796	1.95	0.0	15.60		786.1
MB-3	808.15	2.70	803	.45	0.0	19.97		786.1
MB-4	805.98	2.60	803	.36	0.0	19.77		796.1
MB-5	806.87	3.00	803	3.87	0.0	20.85		786.0
MB-8	803.58	3,50	800	0.08	0.0	18.02		785.8c
MB-7	812.73	3.00	808	.73	0.0	26.75		785.9
MB-8	810.73	3.00	807	.73	0.0	23.54		787.10
MB-0	614.73	2.80	811	.93	0.0	20.59		794.14
MB-10	822.35	3.10	819	.25	0.0	27.65		794.70
MW-7	802.36	2.82	794	1.64	0.0	0.00		502.3
MAY-8 (1)	810.87	3.08	807	7.79	NM	NM		NA.
MAV-0	808.04	2.57	803	1.47	0.0	19.75		788.2
MM-10	803.17	2.27	800	0.90	0.0	17.33		785.6
MW-11	811.09	2,83	808	1.26	0.0	24.44		780.6
Staff Gauges	Elev. at the 0 Mark	of Staff Gauge			1	Distance Selow 0	Mark of Staff Gauge (2)	
SGP-1	791.17	NA.	NA.	NM		1.10		790.0
Staff Gauges	Top of Staff Gauge	Elevation			2	Distance Below To	op of Staff Gauge (3)	
SGP-2	798.16	NA	NA	NM		3.97		794.19
River Elevation	Benchmark Elevat	lon				Surveyed Distance	•	
Upstream location (4)	810.73	NA.	NA	NM		24.03		786.7
Downstream location (5)	796.94	NA	NA.	NM		12.63		784.3

Stickup - Measured distance between the ground surface and the top of casing

ftemsi ftbtoc

- feet above mean sea level
- feet below top of casing. For staff gauges, valve presented is measurement (in feet) below level of staff gauge.
- (1) MW-8 was not measured due to blockage in well.
- (2) O&M Inc. reinstalled and resurveyed during the second quarter sampling event.
- (3) Pond water level measured from surveyed top of staff gauge down to pond water.
- (4) Elevations determined by surveying to known benchmark elevations; benchmark for upstream location MB-8 top of casing.
- (5) Elevations determined by surveying to known benchmark elevations; benchmark for downstream location is concrete splitway on east side of McFeeley Bridge.

SGP-1 - On-Site Pond SGP-2 - Off-Site Pond NM - Not Measured NA - Not Applicable

TABLE 3: FIELD WATER QUALITY MEASUREMENTS CONDUCTED DURING WELL PURGING, SEPTEMBER 2002

Well LD.	Total Depth (ft)	Approx Stickup (ft)	Depth to Water (ftbtoc)	Casing Volume (gal)	Date	Volume Pumped (gal)	рН	Temp (C)	Specific Conductance (umhos/cm) (1)	Specific Conductance (umhos/cm) (2)	Dissolved Oxygen (mg/L)	Conversion Factor (K)
MB-1	37	2.50	13.26	3.85	09/18/02							
						11.5	7.2	17.0	800	943	1.9	0.99
						12.0	7.3	17.0	750	884	2.0	0.99
						12.5	7.3	16.5	700	835	1.9	0.99
MB-2	18	2.80	15.60	0.39	09/18/02							
						1.5	6.9	17.5	820	955	1.3	0.99
						2.0	6.9	17.0	820	966	2.1	0.99
						2.5	7.0	16.5	820	978	1.5	0.99
						3.0	7.0	16.0	820	990	1.6	0.99
						3.5	6.9	16.0	820	990	1.5	0.99
MB-3	24	2.70	17.93	0.98	•	(Well removed fronce-further-action f			oring program as part of e	i condensed monitoring	g program follov	ring
MB-4	35	2.60	17.74	2.80	•	(Well removed fr no-further-action f		•	oring program as part of a n.)	I condensed monitoring	g program follov	ring
MB-5	24	3.00	20.85	0.51	09/18/02							
						1.5	7.1	16.0	700	845	3.1	0.99
						2.0	7.1	16.0	680	821	3.0	0.99
						2.5	7.1	16.0	650	785	3.3	0.99
MB-6	28	3.50	18.02	1.62	09/18/02							
						5.0	6.8	17.0	720	849	4.4	
						9.0	9.0	17.0		0.10	1.4	0.99
						5.5	6.9	18.0	720	829	1.4	0.99 0.99
									720 700			
MB-7	32	3.0	26.75	0.85	09/18/02	5.5	6.9	18.0		829	1.4	0.99
MB-7	32	3.0	26.75	0.85	09/18/02	5.5	6.9	18.0		829	1.4	0.99
MB-7	32	3.0	26.75	0.85	09/18/02	5.5 6.0	6.9 6.9	18.0 17.0	700	829 825 9 6 8	1.4 1.5	0. 99 0. 99
MB-7	32	3.0	26.75	0.85	09/18/02	5.5 6.0 2.5	6.9 6.9 7.0	18.0 17.0 18.0	700 800	829 825	1.4 1.5	0.99 0.99
MB-7 MB-8	32 36	3.0	26.75 23.54	0.85	09/18/02	5.5 6.0 2.5 3.0	6.9 6.9 7.0 7.0	18.0 17.0 16.0 16.5	700 800 800	829 825 966 954	1.4 1.5 1.3 1.5	0.99 0.99 0.99 0.99
						5.5 6.0 2.5 3.0	6.9 6.9 7.0 7.0	18.0 17.0 16.0 16.5	700 800 800	829 825 966 954	1.4 1.5 1.3 1.5	0.99 0.99 0.99 0.99 0.99
						5.5 6.0 2.5 3.0 3.5	6.9 6.9 7.0 7.0 7.0	18.0 17.0 16.0 16.5 16.5	700 800 800 800	829 825 966 954 954	1.4 1.5 1.3 1.5 1.5	0.99 0.99 0.99 0.99

TABLE 3: FIELD WATER QUALITY MEASUREMENTS CONDUCTED DURING WELL PURGING, SEPTEMBER 2002

Well LD.	Total Depth (ft)	Approx Stickup (ft)	Depth to Water (ftbtoc)	Casing Volume (gal)	Date	Volume Pumped (gal)	рН	Temp (C)	Specific Conductance (umhos/cm) (1)	Specific Conductance (umhos/cm) (2)	Dissolved Oxygen (mg/L)	Conversion Factor (K)
MB-9	29	2,80	20.59	1.38	09/18/02							
						4.0	7.6	17.0	420	495	2.2	0.99
						4.5	7.7	17.0	420	495	2.1	0.99
						5.0	7.7	17.0	400	471	2.2	0.99
MB-10	30	3.10	27.65	0.38	09/18/02							
						1.5	7.3	17.0	700	825	4.9	0.99
						2.0	7.3	15.0	690	854	4.7	0.99
						2.5	7.4	15.0	680	842	4.7	0.99

NA - Not Applicable

fibtoc - feet below top of case

stickup - measured distance between the ground surface and the top of casing

(1) - Field measured conductivity.

(2) - Specific conductance value corrected to 25 C and adjusted using conversion factor (K).

Table 4 Data Qualifier Definitions

Qualifier	Description
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value represents its approximate concentration
UJ	The analyte was not detected about the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table 5 Marion (Bragg) Landfill Sample Designation Key Third Quarter 2002 Sampling Event September 2002

Sample Designation	Sample Location	Parameters	Date Collected
Ground Water			
GW01CJ	MB-10	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, SVOCs	09/18/02
GW02CJ	MB-9	TSS, Cl⁻, COD, NH₃-N, Dissolved metals, SVOCs	09/18/02
GW03CJ	MB-5	TSS, Cl⁻, COD, NH₃-N, Dissolved metals, SVOCs	09/18/02
GW04CJ	MB-6	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, SVOCs	09/18/02
GW05CJ	MB-7	TSS, Cl⁻, COD, NH₃-N, Dissolved metals, SVOCs	09/18/02
GW06CJ	MB-8	TSS, Cl⁻, COD, NH₃-N, Dissolved metals, SVOCs	09/18/02
GW07CJ	MB-2	TSS, CI ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs	09/18/02

Table 5 Continued

Sample Designation	Sample Location	Parameters	Date Collected
GW08CJ	MB-1	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs	09/18/02
GW08DPCJ	GW08DPCJ MB-1		09/18/02
GW08MSCJ	W08MSCJ MB-1		09/18/02
GW08MSDCJ	MB-1	TSS, Cl⁻, COD, NH₃-N, Dissolved metals, VOCs, SVOCs	09/18/02
GW09FBCJ	GW09FBCJ Field Blank		09/18/02
GW10TBCJ	Trip Blank	VOCs	09/18/02
Pond Water			
PW01CJ	PW-1 (On-site shallow)	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, SVOCs	09/17/02

Table 5 Continued

Sample Designation	Sample Location	Parameters	Date Collected
River Water			
SW01CJ	SW-1 (Downstream)	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs	09/17/02
SW01DPCJ	SW-1 (Downstream)	TSS, CI ⁻ , COD, NH ₃ -N, Dissolved metals, VOCs, SVOCs	09/17/02
SW01MSCJ	SW01MSCJ SW-1 (Downstream)		09/17/02
SW01MSDCJ	SW01MSDCJ SW-1 (Downstream)		09/17/02
SW02CJ	SW-5 (Upstream)	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, SVOCs	09/17/02
SW03CJ	SW-6 (Lugar Creek)	TSS, Cl ⁻ , COD, NH ₃ -N, Dissolved metals, SVOCs	09/17/02
SW04TBCJ	Trip Blank	VOCs	09/17/02

Table 6: GROUNDWATER CHEMISTRY DATA, SEPTEMBER 2002

MONITORING WELL LOCATION IN AQUIFER	MB-1 BOTTOM	MB-2 TOP	MB-5 TOP	MB-4 BOTTOM	MB-7 TOP	MB-8 BOTTOM	MB-9 TOP	MB-16 TOP	DUPLICATE
UCATION IN AGUIFER	BOTTOM	105	104	BOTTOM	102	BUTTON	100	105	(MB-1)
CL VOLATILES (ug/L)									
Acetone	10 U	10 UJ	NA	NA	NA	NA	NA	NA	10 U
Senzene	10 U	10 U	NA NA	NA	NA	NA	NA	NA	10 U
hiorobenzene	10 UJ	1 J	NA NA	NA	NA	NA	NA	NA	10 U
otal 1,2-Dichloroethene	5 J	3 J	NA	NA	NA	NA NA	NA	NA	5 J
richioroethene	56 J	10 U	NA	NA	NA	NA	NA	NA	65
inyi Chioride	0.9 j	10	NA	NA	NA	NA	NA	NA	0.9 J
Carbon Disulfide	10 ป	0.4 J	NA	NA	NA	NA	NA	NA	10 U
AOLATILE TENTATIVELY (IDENTITFIED COMPO	UNDS (Retention Time) (1)						
CL SEMIVOLATILES (Up/	L)								
is(2-Ethylhexyl)phthelate	໌ 9 ປ	9 U	9 U	10 U	10 U	9 U	9 U	9 U	9 U
exachlorocyclopentadiene	9 Ū	9 U	9 U	10 U	10 U	9 Ü	9 Ú	ĐŪ	ชับ
,4-Dinitrophenol	9 U	9 U	9 U	10 U	10 U	9 U	9 U	9 U	9 Ü
aprolectam	9 Ú	9 U	3 J	10 U	10 U	9 U	9 Ü	9 U	9 Ŭ
Piethylphthelate	9 U	0.2 J	8 U	10 U	10 U	9 U	9 U	9 U	9 Ŭ
EMPVOLATILE TENTATIV	ELY IDENTIFIED COI	APOUNDS (Retention 1	(1)						
Inknown	3 J	19 J	4 J	38 J	2 J	115 J	5 J	L 99	
henoi, tert-butyl-Isomer	- •	3 J				****	• •		
iethyltoluemide			71 NJ					9 NJ	
4'-(1-Methylethylidene)bis	chenol			3 NJ					
hthelic anhydride						3 NJ			
4-dichloro-1-(trichloromet	hvi)benzene					5 NJ			
Inknown acid ester	• • • • •								
(3H)-Benzothiazoione				10 NJ					
,4,5,6,7,7-hexachloro-bicy	clo(2-2-1)hept-5-ene-2	.3-dicarboxviic acid				9 NJ			
Bultur			11 NJ			¥ 11¥			

Table 6: GROUNDWATER CHEMISTRY DATA, SEPTEMBER 2002

MONITORING WELL	MB-1	MB-2	MB-6	MB-6	MB-7	MB-4	MB-9	MB-10	DUPLICATE (2)
OCATION IN AQUIFER	BOTTOM	TOP	TOP	BOTTOM	TOP	BOTTOM	TOP	TOP	(MB-1)
ISSOLVED TAL METALS	(uo/L)								
\lumininum	23.4 U	49.7 U	24.8 U	23 U	16.5 U	2410	36 .7 ℃	21.5 U	36.7 U
Antimony	2.2 U	2.3 U	1.8 U	2.9 U	1.7 U	1.7 U	1.7 U	1.9 U	1.7 U
Arsenic	9.0	87.6	23.7	124	74.8	135	10.4 J	2.5 U	8.2 J
Barium	193	514	389	371	590	311	66.9	94.7	189
Servillum	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.28 U	0.20 U	0.20 U	0.20 U
Cadmium	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Calcium	118000	129000	94400	117000	98100	137000	57700	111000	116000
Chromium	0,40 UJ	0.40 UJ	0.40 UJ	0.40 UJ	0.40 UJ	8.0	0.40 UJ	0.40 UJ	0.40 UJ
Cobatt	1.9 J	1.5 J	1.6 j	1.5 J	0.40 UJ	3.1	0.40 UJ	0.40 UJ	1.4 J
Copper	0.80 UJ	0.80 Ü	0.80 UJ	0.80 UJ	0.80 U	18.9	0.80 UJ	0.80 UJ	0.80 U
ron	1520	19600	7900	16100	11000	18200	2080	8.6 UJ	1510
.ead	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	30.3	1.3 UJ	1.3 UJ	1.3 UJ
Aagnesium	32800	29100	28800	28600	32500	87200	20700	34300	32200
Aanganese	901	133	191	82.3	68.2	278	505	1.5 U	898
Aercury	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U
vickal .	1.6 J	1.6 J	2.2 J	10.8 J	0.72 J	11.5 J	0.60 UJ	0.60 UJ	1.5 J
Potassium	3160	10800	6570	10300	15400	27400	1620	2740	3090
Selenkan	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ
Sliver	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Bodium	12600 J	17000 J	15800 J	13100	31900 J	112000 J	8600 J	11800 J	12100
Chaillum	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U
/anadium	0.30 U	0.30 UJ	0.30 UJ	0.30 UJ	0.30 UJ	5.6	0.30 UJ	0.30 UJ	0.30 UJ
Zinc	3.1 U	5.1 U	7.0 U	6.1 U	8.1 U	80.8	3.1 U	6.4 U	11.60 U
NDICATOR PARAMETERS	S (ma/L)								
Ammonia-Nitrogen	0.10 U	7.3	4.1	3.8	6.8	5.3	0.52	0.10 U	0.10 U
Chemical Oxygen Demand	10.0 U	21.3	10.4	16.9	25.6	64.8	10.0 U	10.0 U	10.0 U
Chloride	20.6	18.9	16.7	13.2	23.6	27.3	27.3	23.0	20.3
Total Suspended Solids	7.8	12.4	16.6	23	31.2	44.8	52.8	70.2	6.2
Notes:									

NA - Not analyzed; parameter removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision. Sampling locations, MB-3 and MB-4, removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.

(1) Unknown Tentatively identified Compounds (TICs) are summed or totaled by the number of unknown TICs and by the concentration of unknown TICs. TICs for which a compound class (e.g., unknown phtalate) or individual compound (e.g., 1H-Bertzotriazole) are identified, those compounds are listed separately with concentration and data qualifier and are not included in the total number or total concentration. The unknown TICs were totaled to provide condensed summary information in the data table. Any questions regarding specific unknown TICs can be investigated in the data variidation report.

Table 7: POND WATER CHEMISTRY DATA, SEPTEMBER 2002

SAMPLING LOCATION	OFFRITE POND	OFFEITE POND	ONSITE POND	ONSITE POND	
LOCATION IN MATRIX	BOTTOM (FWI-I)	TOP (PW-3)	BOTTOM (PW-2)	TOP (PW-1)	
TOL VOLATILES (MOL)					
NA .	NA	NA.	NA .	NA.	
UNI ATE E TENTATIVE V EN	ENTIFIED COMPOUNDS (Recentlor	These			
NA	NA NA	NA NA	NA.	NA.	
TCL SEMINOLATILES (UG/L) NONE DETECTED					
SEMINOLATILE TENTATIVE	LY IDENTIFIED COMPOUNDS (Res	ention Time) (1)			
Diethyllolumide	NA .	NA NA	NA.	2 NJ	
DIRECTIVED TAL METALS A					
Atminium	W.	NA.	NA.	57.7 U	
Arimony	NA.	NA.	NA.	1.6 U	
Americ	NA	NA.	NA.	3.3 J	
Berlum	NA	NA.	NA	104 J	
Berythum .	NA.	NA.	NA.	0.20 U	
Cedmlum	NA.	NA.	NA.	0.20 U	
Caldum	NA NA	NA.	NA.	35700	
Chromium	NA NA	NA NA	NA NA	0. 60 U	
Cobet	NA.	NA.	NA.	0.40 U	
Copper	NA.	NA.	NA.	0.60 U	
Iron	NA.	NA.	NA NA	8.7 U	
Leed	NA NA	NA.	NA NA	0.70 U	
Magnesium	NA.	NA.	NA.	30100	
Manganase	NA.	NA.	NA.	0.50 U	
Mercury	NA.	NA.	NA.	0.10 U	
Nickel	NA.	NA.	NA.	1.9 U	
Polestium	NA.	NA.	NA.	4410 J	
Seterfum	NA NA	NA NA	NA.	2.9 U	
Silver Sodium	25	NA NA	NA NA	0.70 U	
Thefun	25	NA NA	NA NA	18100 26 U	
Vanadium	NÃ.	NA.	NÃ.	0.40 LU	
Zinc	NA.	NA.	, <u> </u>	0.70 W	
PIDICATOR PARAMETERS (
Anstronia-Nitrogen	NA NA	NA.	NA.	0.10 U	
Chemical Owgen Demand	NA.	NA NA	NA NA	21.3	
Chloride	NÃ.	NA NA	NA NA	21.3	
Total Suspended Solids	NA.	NA.	NA.	9.6	
MELD PARAMETERS					
Temperature (C)	NA.	NA.	NA.	25.0	
oH	NÃ.	25	NA NA	8.54	
Conductivity (umhoe/om) (2)	NA.	× ×	NA.	480	
Conductivity (umhoe/on) (3)	NA.	NA NA	NA.	406	
Dissolved Olegen (mg/L)	NA.	. N		6.7	
Notes:			· · · · · · · · · · · · · · · · · · ·	W.I.	

NA - Not enalyzed; peremeter removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision. Sampling locations, PW-2, PW-3, and PW-4, removed from water quality monitoring program as part of a condensed monitoring program. following a no-further-action Record of Decision.

ND - Not Detected

(1) Unknown Tertatively Identified Compounds (TICs) are summed or totaled by the number of unknown TICs and by the concentration of unknown TICs. TICs for which a compound class (e.g., unknown phasis) or individual compound (e.g., 1H-Berzotriazole) are identified, those compounds are tated separately with concentration and date qualifier and are not included in the total number or total concentration. The unknown TiCs were totaled to provide condensed summary information. In the data table. Any quastions regarding specific unknown TiCs can be investigated in the data validation report.

(2) - field measured specific conductivity at ambient temperature

(3) - specific conductivity corrected to 25 degrees C.

Table 8: SURFACE WATER CHEMISTRY DATA, SEPTEMBER 2002

LOCATION	SW-1	SW-2	\$W-3	\$W-4	SW-8	\$W-6	DUPLICATE
	Downstream	Adjacent	Adjacent	Adjacent	Upetreem	Lugar Creek	(SW-1)
CL VOLATILES (ug/L)							
	ND	NA	NA.	NA	NA	NA	NO
OLATILE TENTATIVELY IDEN	ITIFIED COMPOU	NDS (Retent	ion Time)				
	ND	NA.	NA	NA	NA	NA	ND
CL SEMINOLATILES (WOLL)							
	ND	NA	NA	NA	ND	ND	ND
EMMOLATILE TENTATMELY	IDENTIFIED COM	POUNDS (R	etention Time)	(1)			
	ND	NA	NA	NA.	ND	ND	ND
MBSOLVED TAL METALS (UG	AL)						
Jurráninum	57.7 U	NA	NA	NA	57.7 U	57.7 U	57.7
nilmony	60.0 U	NA	NA	NA	1.6 U	1.6 U	
rsenic	2.9 J	NA	NA	NA	1.5 J	1.3 U	
Serium	108 J	NA	NA	NA	97.8 J	69.7 J	99.4
ery@um	0.20 U	NA	NA	NA	0.20 U	0.20 U	0.20
admium	0.20 U	NA	NA	NA	0.20 U	0.20 U	0.20
alcium	86400	NA	NA	NA	84000	98900	85200
chromium	10.0 U	NA	NA.	NA.	0.78 J	0.60 1	
obelt	50.0 Ŭ	NA.	NA.	NA	0.40 U	0.40 U	0.40
opper	2.9 .1	NA	NA	NA	1.3 J	1.1 J	1.5
ron	8.7 Ū	NA	NA	NA	8.7 U	8.7 U	
and	0.70 U	NA	NA	NA	0.70 U	0.70 U	
facrosium	38600	NA	NA	NA	36300	42900	36300
Aangeneee	12.2	NA	NA	NA.	8.8	46.9	11.6
Mercury	0.10 U	NA	NA	NA.	0.10 U	0.10 U	
icies	2.9 J	NA	NA	NA	1.1 J	0.80	
Olesekem	3400 J	NA	NA.	NA.	3230 J	2450 J	3370
letenium	3.6 U	NA.	NA	NA.	2.9 U	2.9 U	
	0.70 u	NA	NA	NA	0.70 U	0.70 U	
lodium	44100	NA.	NA.	NA.	42900	24700	43900
hellum	2.6 U	NA	NA.	NA.	2.6 U	2.5 U	
/enedium	2.9 J	NA	NA	NA	0.40 UJ		
Inc	0.70 UJ	NA	NA	NA	2.5 J	0.70 U	
NDICATOR PARAMETERS (m	g/L)						
ummonia-Nitrogen	R	NA	NA	NA.	0.10 U	0.10 U	R
Chemical Oxygen Demand	10 U	NA	NA	NA	10 U	10 U	
Chloride	75.1	NA	NA	NA	79.3	41,7	76.5
otal Suspended Solids	9.9	NA	NA	NA	13.6	1	8.2
TELD PARAMETERS							
emperature (C)	26.0	NA	NA	NA	23.0	20.0	26.0
H	8.21	NA	NA	NA.	8.35	8.19	8.21
Conductivity (umhos/cm) (2)	800	NA	NA	NA	800	780	500
Conductivity (umhos/cm) (3)	746	NA	NA	NA	793	825	746
Dissolved Chargen (mg/L)	6.81	NA	NA	NA	7.47	7.07	6.81

NA - Not analyzed, parameter removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision. Sempling locations, SW-2, SW-3, and SW-4, removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.

NR - Not recorded

ND - Not Detected

(1) Unknown Tentatively identified Compounds (TICs) are summed or totaled by the number of unknown TICs and by the concentration of unknown TICs. TICs for which a compound class (e.g., unknown pitalists) or individual compound (e.g., 1H-Bentotriazole) are identified, those compounds are lated separately with concentration and date qualifier and are not included in the total number or total concentration. The unknown TICs were totaled to provide concentration are summery information in the date table. Any questions regarding specific unknown TICs can be investigated in the data velidation report.

(2) - field measured specific conductivity at ambient temperature

(3) - specific conductivity corrected to 25 degrees C.

TABLE 9: WATER QUALITY CRITERIA - UPDATED 2000

	Aoute		Chronic					
	Aquatic		Aquatic		Human			
Parameter	Criteria		Critoria		Health		MCL	
CL Volatiles (ug/L)								
Agelone	10000	+	222	+			••	
Benzene	5300	Ε	118	+	400	1	5	E
Chlorobenzene	1950	-	50	E	2026			-
1.2-Dichloroethene (total) (1)		•	•••	_	2020		70 and 100	_
Methylene Chlorida	193000	E	4289		157	E	_	-
remyene Chionos Tokene	17500	Ē	389	:	424000	-	1000	E
	45000	Ē	21900	Ē	807	i	1000	
Trichloroethane		=		_		•		Ē
/inyl Chloride	••		••		5246	+	2	E
CL Semivolatiles (ug/L)								
Phenoi	10200	E	2560	E	3500	E		
Phihalate Esters	940	E	3	E	50000	F	••	
TAL Metals and Cyanide (ug/L)								
Viuminum								
Antimony					45000	1		£
Arsenic	360	l .	190	1	0.175	i	50	Ē
Berlum		•		•		•	2000	Ē
Berysum			••		1.17	1	4	Ē
Sedmium*	6.7	1	1.6	ı	60	•	5	Ē
Calcium	0.7	•		•		•		2
		1	11		•••		***	_
Chromium	16			1	3389	+	100	E
Cobalt	::				••		••	_
Copper* (2)	28	1	18	l .			1200	E
Cyanide	22	L	5.2	1	24242	+	200	E
ron	1000	Æ	••				••	
Lead* (2)	150	1	5.8	1	51	+	15	Ε
Magnesium					••			
Manganese	••				••		••	
Mercury	2.4	F	0.012	1	0.15	1	2	E
Nickel	2100	f	240	ı	100	1	100	E
Potessium							• •	
Selentum	130	1	25	†			80	Ε
Silver*	9.2	i	0.12	E			80	Ē
Sodium			•••	-			•	_
Theillum					48	1	2	Ε
Vanedum	11000		100	+		•	•	-
Zinc*	175	j	190	j				
DEM Parameters (mg/L) Ammonia, Total Unionizad**	0.027		0.0029					
		1		3			••	
COO					••			
Chloride	860	ı	230	1			••	
TSS			••				• •	

[&]quot;Acute and chronic oriteria calculated based on worst-case hardness=161 mg/L ""Acute and chronic oriteria calculated based on worst-case t+5C, pH=7.0

^{- -} Criteria not developed

MCL - Maximum Conterninent Level (Updated per the Safe Drinking Water Act of 1985 and later revisions brown as the Phase II, Phase II, and Phase V rules. Phase I became effective January 9, 1999, Phase II became effective in 1992, and Phase V became effective January 17, 1994.)

Source of Data

E - U.S. EPA

^{1 -} IDEM (327 IAC 2)

See section 6.2 of February 1990 report by Beek Consultents Limited Beseine Water Quality Conditions for discussion of sources for the criteria.

(1) The 1,2-Dichloroethene MCL standards are divided into cle-1,2-Dichloroethene at 70 upt. and trans-1,2 Dichloroethene at 100 upt...

^{(2) -} The "MCL" value is an action level for lead and copper (i.e., the lead and copper rule) but it only applies to water supplies

as measured at the household tap.

TABLE 10: CALCULATED ACUTE AQUATIC CRITERIA AND CHRONIC AQUATIC CRITERIA FOR AMMONIA-NITROGEN, SEPTEMEBR 2002

Sample	Well	-	Temp	Total Ammonia in Sample	Calculated Un-ionized Ammonia (in Sample)		I Un-lonized riteria (mg/L)**	Crite	oria Jeded
Matrix	Number	ρН	(C)	(mg/L)	(mg/L)*	AAC	CAC	AAC	CAC
Ground Water	MB-1	7.3	16.5	D.10 U	0.0003	0.087	0.0114	No	No
	MB-2	6.9	16.0	7.3	0.0187	0.052	0.0054	No	Yes
ı	MB-5	7.1	16.0	4.1	0.0163	0.071	0.0084	No	Yes
	MB-6	6.9	17.0	3.8	0.0100	0.054	0.0055	No	Yes
	MB-7	7.0	16.5	6.8	0.0213	0.061	0.0066	No	Yes
	MB-8	7.2	16.0	5.3	0.0220	0.073	0.0088	No	Yes
	MB-9	7.7	17.0	0.52	0.0089	0.149	0.0367	No	No
	MB-10	7.4	15.0	0.10 U	0.0003	0.094	0.0142	No	No
	Duplicate+	7.3	16.5	0.10 U	0.0003	0.087	0.0114	No	No
Pond Water	On-site (S)	8.5	25.0	0.10 U	0.0082	0.352	0.4016	No	No
Surface Water	SW-1	8.2	26.0	U	0.0000	0.350	0.2013	No	No
	Duplicate++	8.2	26.0	Ū	0.0000	0.350	0.2013	No	No
	SW-5	8.4	23.0	0.10 U	0.0050	0.296	0.2259	No	No
	SW-6	8.2	20.0	0.10 U	0.0029	0.230	0.127	No	No

AAC - Acute Aquatic Criteria

CAC - Chronic Aquatic Criteria

^{* -} Values calculated according to the Indiana Register (1990) (327 IAC 2). Unionized values calculated using 1/2 the detection limit for less than detection limit total results.

^{** -} Calculated according to the USEPA Quality Criteria for Water, 1986 EPA 440/5-88-001(as revised by Water Quality Criteria and Standards Activity Report, August 1992)

^{+ -} Readings taken from monitoring well MB-1

^{++ -} Readings taken from surface water sample location SW-1.

TABLE 11: ACUTE AQUATIC CRITERIA AND CHRONIC AQUATIC CRITERIA FOR TAL METALS CONCENTRATIONS DEPENDENT ON HARDNESS, SEPTEMBER 2002

					Ç	deriver (u	T)		Chro	minutes (we'L'			Cop	(4)	Į.		Lag	(89/1)			Net	i (vol.)		Siver (v	ofl)		Zine (t	e/L)	
Sample Matrix	Sample Legation	Herdness (reg/L)	Culclum (mg/L)	Magnacium (mg/L)	Sample Conc.**		AAC-	CAC.	Semple Conc.**		AAC"	CAC	Sample Conc."		WC.	CAC- C	emple onc."		AAC*	CAC	Semple Cons.**		AAC*	CAC	Sample Cape.**		MC.	Sample CAC(1; Conc.**		AAC"	CAC
Disselved Mea	ald.																														
Ground Winter	MB-1	430.0	118.0	\$2.8	0.40	U	20	-4	0.4	Ü,	8734	643	0.8	w	70	41	1.3	W	523	20	1.6	7	4871	842	0.50	W	50	3.1	Ú	403	366
	MB-2	442.3	128.0	29.1	0.40	Ū	21	4	0.4	W	6006	600	0.0	U	72	42	1.3	ш	542	21	1.6	3	4980	565	0.50	w	62	5.1	U	412	374
	MB-5	384.5	94.4	28.8	0.40	Ü	16	3	0.4	iii	4896	584	0.8	w	58	36	1.3	w	400	16	2.2	J	4138	480	0.59	w	36	7,0	U	342	310
	MB-6	410.2	117.0	20.6	0.40	Ü	19	3	0.4	W	8517	664	0.8	ш	67	39	1.3	w	492	19	10.8		4661	520	0.50	ü	46	6.1	U	367	360
	MB-7	379.0	86.1	32.5	0.40	U	16	3	0.4	W	5171	616	0.8	U	62	37	1.3	i.	448	17	0.7	Ĵ	4378	487	0.50	w	40	8,1	υ	362	328
	MB-4	701.3	137.0	87.2	0.40	U	36	5	8.0		8880	1020	18.9		111	62	30.3		975	38	11.5	J	7300	819	0.60	w	116	80.8		610	582
	MB-9	229.4	67.7	20.7	0.40	U	10	2	6.4	w	3428	400	0.8	w	30	24	1.3	ш	236	9	0.6	w	2863	315	0.50	w	17	3.1	U	237	214
	MB-10	418.7	111.0	34.3	0.40	U	20	3	0.4	w	8610	000	0.6	W	68	40	1.3	w	505	20	0,6	w	4763	629	0.50	w	48	6.4	U	304	367
	Duplicate +	422.5	118.0	32.2	0.40	U	20	4	0.4	w	5652	674	6.8	U	86	41	1.3	w	511	20	1.5	J	4800	534	0.60	W	48	11.8	U	397	350
							30.0																								فنند
Pond Weter	On-site (3)	213.1	35.7	30.1	0.20	U	9	2	0.8	Ú	3227	385	0.8	J	36	23	0.7	Ü	214		1.9	U	2880	299	0.70	U	18	0.7	W.	222	201
Surface Water	8W-1	384.1	85.4	36.6	0.20	U	17	3	10.0	Ú	5004	596	2.9	J	80	36	0.7	5	423	16	2.9		4232	470	0.70	- u	37	0.7	W	380	317
	Duplicate++	362.4	85.2	36.3	0.20	U	17	3	0.00	U	4065	564	1.5	J.	80	36	0.7	υ	420	18	2.1	J	4216	400	9.70	U	37	20.0	U	248	316
	2W-6	355.3	84.0	36.3	0.20	U	16	3	0.70	J	4804	586	1.3	د	50	36	0.7	U	410	16	1.1	j	4145	461	9.70	U	36	2.6	J	343	310
	8W-6	423.8	96,9	42.0	0.20	<u> </u>	20	4_	0.60	U	5667	676	1.1			_41	0.7	U	513_	20	0.8	U.	4812	536	0.70	U	49	0.7	w_	396	360

- Values calculated according is the Indians Register (1880) (327 IAC 2).

- Sample consentrations are upt. (ppb)
AAC - Acute Aquetic Criteria
CAC - Chruric Aquetic Criteria

- Duplinate semple collected from moritaring well MB-1.

- Duplinate semple collected from surface water sempling location SW-1.

(1) No CAC is calculated for silver.

TABLE 12: SAMPLING LOCATIONS EXCEEDING APPLICABLE WATER QUALITY CRITERIA, SPETEMBER 2002

		· · · · · · · · · · · · · · · · · · ·	Monitoring			Criterion		Average (1)		Concentration	
Parameter	Matrix	Sample Location	Well Zone (1)	Concentration (ug/L)	Criterion Exceeded	Concentration (ug/L)	Source	Concentration Of Zone (ug/L)	Exceeds Criterion	After Mixing (ug /L) (2)	Exceeds Criterion
TCL Volatiles (ug/L)	· - · · - · · · · · ·										
Trichloroethane	Groundwater	MB-1	t	56	MCL	5	Ε	31	Yes	0.02	No
Trichloroethane	Groundwater	Duplicate	ŀ	65	MCL	5	E	35	Yes	0.02	No
Dissolved TAL Metals											
Arsenic	Groundwater	MB-1	1	9.0	HH	0.175	1	48.3	Yes	0.03	No
Arsenic	Groundwater	MB-2	1	87.6	HH	0.175	1	48.3	Yes	0.03	No
Arsenic	Groundwater	MB-5	II	23.7	HH	0.175	1	73. 9	Yes	0.04	No
Arsenic	Groundwater	MB-6	11	124	HH	0.175	1	73.9	Yes	0.04	No
Arsenic	Groundwater	MB-7	IH	74.8	HH	0.175	l	104.9	Yes	0.06	No
Arsenic	Groundwater	MB-8	111	135	HH	0.175	1	104.9	Yes	0.06	No
Arsenic	Groundwater	MB-9	NA	10.4	HH	0.175	1	-	_	_	
Arsenic	Groundwater	Duplicate	1	8.2	HH	0.175	ŀ	48.3	Yes	0.03	No
Arsenic	Groundwater	MB-2	ı	87.6	MCL	50	E	48.3	No	0.03	No
Arsenic	Groundwater	MB-6	H	124	MCL	50	E	73.9	Yes	0.04	No
Arsenic	Groundwater	MB-7	m	74.8	MCL	50	E	104.9	Yes	0.06	No
Arsenic	Groundwater	MB-8	HI	135	MCL	50	E	104.9	Y86	0.06	No
Iron	Groundwater	MB-1	1	1520	AAC	1000	E	10560	Yes	6	No
Iron	Groundwater	MB-2	l	19600	AAC	1000	E	10560	Yes	8	No
Iron	Groundwater	MB-5	Н	7900	AAC	1000	E	12000	Yes	7	No
Iron	Groundwater	MB-6	\$1	16100	AAC	1000	Ε	12000	Yes	7	No
Iron	Groundwater	MB-7	III	11000	AAC	1000	E	14600	Yes	8	No
Iron	Groundwater	MB-8	111	18200	AAC	1000	Ε	14600	Yes	8	No
Iron	Groundwater	MB-9	NA	2080	AAC	1000	E	-		-	_
Iron	Groundwater	Duplicate	1	1510	AAC	1000	E	10560	Yes	8	No
Indicator Parameters				(mg/L)		(mg/L)		(m g/L)		(mg/L)	
Unionized	Groundwater	MB-2	1	0.0187	CAC	0.0029	E	0.0095	Yes	0.000005	No
Ammonia (mg/L)	Groundwater	MB-5	ĺ	0.0163	CAC	0.0029		0.0132	Yes	0.000007	No
(···•	Groundwater	MB-6	Ï	0.0100	CAC	0.0029		0.0132	Yes	0.000007	No
	Groundwater	MB-7	III	0.0213	CAC	0.0029		0.0217	Yes	0.000012	No
	Groundwater	MB-8	Ш	0.0220	CAC	0.0029		0.0217	Yes	0.000012	No
	Groundwater	MB-9	NA	0.0089	CAC	0.0029	Ε	_	-	-	-

AAC - Acute Aquatic Criteria
CAC - Chronic Aquatic Criteria

Duplicate - Duplicate sample collected from monitoring well MB-1

NA - Not applicable; sampling location is not included in the monitoring zone calculations.

HH - Human Heelth Criteria
MCL - Maximum Contaminant Level

⁽¹⁾ Refer to the Environmental Resources Management (ERM) Remedial Action Plan for Marion (Bragg) Landfill Site, Marion, Indiana, dated 1989, for definition of monitoring well zones and concentration calculations. Monitoring well zone i will consist of MB-1 and MB-2 with condensed monitoring program, since MB-3 and MB-4 have been removed from the sampling program.

⁽²⁾ Refer to the Camp, Dresser, and McKee (CDM) Remedial Investigation Report, dated 1987, for mixing zone calculations.

APPENDIX A Chain-of-Custody Forms

CHAIN	-OF-CUS	TODY	RECORD
CHAIL	-UI -UUG	IODI	NEUUNU

CompuCh	EM G	Project N				-00		Address			_		—т	Daia				
a division of Liberty Analytics		LOJ e ct M	aille . かといか。	Beauti						<u>am</u>	•		{	run	I(-O)	r-Cou		
501 Madison Avenue	. -	Carrier :	Feb.	Brage	F			(3)					-	Tele	ah-	1 20	79 C 10 1000	
Cary, NC 27513	L	Calliel .	FED	53607		79	Danville IN4612							Telephone No.: 3\ i 7\6 266 Sampling complete? Or N (see Note 1)				
1-800-833-5097		Sampler			1400	1-1	Sampler Signature : WH							Project-specific (PS) or Batch (B) QC ?				
3OX #1 1. Surface Water	5. Trip Blank		30X #2 A.		F. Ice O	nly	Jenipit	BOX #3		tered	21	Box #4		H. Hi	_	apec	Box #6 C. CLP 3/90 T. TCLP	
							G. Other			U. Unfiltered				M. M	-	m	S. SW-846	
,	B. Waste	1		NaOH + Ice	H. NaHS	504 + los	,			-Buth				L. Lo			W. CWA 600-series	
4. Rinsate	9. Other <u>hu</u>	17	•	H2SO4 + Ice	I. ZnAc+	NaOH +	ice		J		`						O. Other	
5, Soil / Sediment / Sludg		E.	Unpreserved	3:0	. Kic	15	L									1		
		1	Box #1 B	ox #2 Box #3	Box #4	Box #6					П			T	T	\top		
	2002	1	1	1 2 2					11		اح	1						
Sample ID	18	}	}	e #	Conc]	35	P) GC			물	ال	[_]		<u>کا</u>	J	Remarks / Comments	
(9 characters maximum)		ł	}	4 A	Ĭ <u>ĕ</u>	,	of Bottles	r Lab C		3 3	Ž	ا و	/TH	9	7	3	(see Notes 2 & 3)	
•	Date:Ye	iğe Li	Matrix	Preservative Filtered / Unfiltered	Expected	Method	. 0	Use for (MS or	SVOC	Pc8 Pc8 Herbio		Cyanide TOC / TOX	08G/	∂	커 기	N,		
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G1406 PB	11/1	10:30	11	ZB			4		$\perp \downarrow \downarrow \downarrow$		$\downarrow\downarrow\downarrow$					1	BNA-TCE	
7W07PB	//	11:45		x B			9		<u> </u>		Ш				\coprod		metals - HUGH IU	
GWOBPB	//	1230		X B			9									\prod	COD - Hosey + 10	
GWO EDPPB	/	1:1							Ш								NH-N-H-Jacobs	
GWOEMSPB	,														V	\prod	TSS CI IC	
SWOEMEDPB	/	111	1	1 1			1		1]		I				1	1		
5WO 4TBPB		1400	U	A U			3		Χ									
GWICTBPB.		1405	(Q	AU			3		<							1		
GWO9FBPB	1,1	1410	9	x u	L	7	9		××		X			X	X	X	metals need Asserved	
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Company Name: (\$1) Tro				CO Compa	ny Name:			Time: Company					any N	y Name: Time:				
#1 Received By: (Sig)	·	Date:	#2 Rec	eived By:	(Sig)				Date:		#3 Re	ceive	d By:	(Siç)	Date: .		
Company Name:		Time:	Compa	ny Name:	<u>:</u>				Time:		Comp	any N	lame:	<u>:</u>		Time:		

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CHAIN-	OF-CI	JSTODY	RECORD

			<u> </u>		
a division of Liberty Analytical Corp.	Name: R	Client Ad	dress: O4MIn		tact: P.B., ton
	Tarion Brace Fed Ex	<u>gy</u> 30	3 N. Indiana	Telephone N	0.:317718368
Cary, NC 27513	10.: 8253607		abile Long		omplete? Or N (see Note 1)
	r Name : Pete Bu	Sampler S	Signature : WHI		ific (PS) or Batch (B) QC ?
BOX #1 1. Surface Water 6. Trip Blank	BOX #2 A. HCI + Ice			Box#4 H. High	Box #6 C. CLP 3/90 T. TCLP
2. Ground Water 7. Oil	B, HNO3 + Ice	G. Other	U. Unfiltered	M. Medium	S. SW-846
3. Leachate 8. Waste	C. NaOH + Ice		B-Both	L. Low	W. CWA 600-series
4. Rinsate 9. Other 5. Soil / Sediment / Sludge	D. HZSO4 + Ice	1. ZnAc+NaOH + Ice Z = X+B+D+F			O. Other
5, SOIL/ Sediment / Struge		411DIOZ	<u>-</u>		
Sample ID (9 characters maximum)	Matrix Preservative Box #1 Box #5 Box #3	Expected Conc. Box 448 Box 460 No. of Bottles		CCD NH2D TSS (CI)	Remarks / Comments (see Notes 2 & 3)
S002PB: 9,171500	1 2 B	1 e13 6	X	XXX	BNA - TCO
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SWO1198 11/1615		9	X		COD-HISON +ICE
5W010PPB // 11		ωρ			NH3N- HSOGIETC
SWOIMSPB /		В			TSS/CI-Ea
SWOINSDPB 1, 1J.J	1	1113			
GW01 PB 9/1801.40	2	1 63			
GW02PB 1/10815					
GW03PB / 0850					
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Company Name: OSM Th	Time: (800) Compa	pany Name:	Time:	Company Name:	Time:
#1 Received By: (Sig)	Date: #2 Rec	ceived By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name:	Time: Compa	pany Name:	Time:	Company Name:	Time:

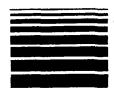


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CHAIN	I-OF-C	USTODY	RECORD

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a division of Liberty Analytical Corp. 501 Madison Avenue, Cary, NC 27513 Phone: (919) 379-4000 Fax: 4050 Internal Log-In Chain-of-Custody Report For Samples Received: 09/19/2002

Customer: O & M

Project: MARION BRAGG

Quote: Q1067

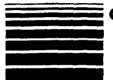
Project Manager: Rodney Raimonde

919-379-4018

rraimonde@compuchemlabs.com

Lab ID	Client Sample ID	Collect Date	Receive Date	Due Date	Hold Date	Matrix	Media	#	Analysis	Comments
	Sampie 12	2210	2	2	2000					
RW1067-1	GW01PB	9/18/2002	9/19/2002	10/2/2002	##########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#######################################	Water	plastic liter	1	CHLORIDE	
					###########	Water	500ml plastic	1	METALS-DISS-	
									ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
RW1067-10	GW09FBPB	9/18/2002	9/19/2002	10/2/2002	##########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**Please filter & preserve in house
					*******	Water	plastic liter	1	CHLORIDE	<u>-</u>
					########	Water	plastic liter	1	METALS-DISS-	
							•		ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
					9/29/2002	Water	40ml vial	3	VOA-OLM04.2-5ML	
RW1067-11	GW10TBPB	9/18/2002	9/19/2002	10/2/2002	9/29/2002	Water	40ml vial	3	VOA-OLM04.2-5ML	PPS 489**
RW1067-2	GW02PB	9/18/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	500ml plastic	1	METALS-DISS-	
							-		ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04,2	
					9/25/2002	Water	plastic liter	0	TSS	
RW1067-3	GW03PB	9/18/2002	9/19/2002	10/2/2002	########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					***********	Water	plastic liter	1	CHLORIDE \	
					#########	Water	500ml plastic	1	METALS-DISS-	
						-	·	-	П.М04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002		plastic liter	0	TSS	
RW1067-4	GW04PB	9/18/2002	9/19/2002	10/2/2002			plastic liter	1	AMMONIA (AS N)	PPS 489**
	-···-	2, 10.2302			************		plastic liter	1	CHLORIDE	

					#######################################	Water	500ml plastic	I	METALS-DISS-	
									ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
RW1067-5	GW05PB	9/18/2002	9/19/2002	10/2/2002	#######################################	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#######################################	Water	plastic liter	1	CHLORIDE	
					#######################################	Water	500ml plastic	1	METALS-DISS-	
1									ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
RW1067-6	GW06PB	9/18/2002	9/19/2002	10/2/2002	*******	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					##########	Water	plastic liter	1	CHLORIDE	
					#######################################	Water	500ml plastic	1	METALS-DISS-	
									ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
RW1067-7	GW07PB	9/18/2002	9/19/2002	10/2/2002	#######################################	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					##########	Water	plastic liter	1	CHLORIDE	
					##########	Water	500ml plastic	1	METALS-DISS-	
							_		ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
					9/29/2002	Water	40ml vial	3	VOA-OLM04.2-5ML	
RW1067-8	GW08PB	9/18/2002	9/19/2002	10/2/2002	###########	Water	plastic liter	3	AMMONIA (AS N)	PPS 489**
					***************************************	Water	plastic liter	3	CHLORIDE	
					************	Water	500ml plastic	3	METALS-DISS-	
							-		ILM04.0	
					9/24/2002	Water	amber liter	6	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
	_				9/29/2002	Water	40ml vial	9	VOA-OLM04.2-5ML	
RW1067-9	GW08DPPB	9/18/2002	9/19/2002	10/2/2002	##########	Water	plastic liter	i	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
ļ					########	Water	500ml plastic	1	METALS-DISS-	
							-		ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
					9/29/2002	Water	40ml vial	3	VOA-OLM04.2-5ML	



a division of Liberty Analytical Corp. 501 Madison Avenue, Cary, NC 27513

Phone: (919) 379-4000 Fax: 4050

Internal Log-In Chain-of-Custody Report For Samples Received: 09/19/2002

Customer: O & M

Project: MARION BRAGG

Quote: Q1067

Project Manager: Rodney Raimonde

919-379-4018

rraimonde@compuchemlabs.com

	Client	Collect	Receive	Due	Hold					
Lab ID	Sample ID	Date	Date	Date	Date	Matrix	Media	#	Analysis	Comments
RU1067-1	SW01PB	9/17/2002	9/19/2002	10/2/2002	##########	Water	plastic liter	3	AMMONIA (AS N)	PPS 489**USE FOR QC
					#######################################	Water	plastic liter	3	CHLORIDE	
					#########	Water	500ml plastic	3	METALS-DISS-	
									ILM04.0	
					9/24/2002	Water	amber liter	6	SVOA-OLM04.2	
					9/24/2002	Water	plastic liter	0	TSS	
					9/29/2002	Water	40ml vial	8	VOA-OLM04.2-5ML	
RU1067-2	SW01DPPB	9/17/2002	9/19/2002	10/2/2002	#######################################	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					##########	Water	plastic liter	1	CHLORIDE	
					##########	Water	500ml plastic	1	METALS-DISS-	
									ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/24/2002	Water	plastic liter	0	TSS	
					9/29/2002	Water	40ml vial	3	VOA-OLM04,2-5ML	
RU1067-3	SW02PB	9/17/2002	9/19/2002	10/2/2002	############	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					##########	Water	plastic liter	1	CHLORIDE	
					##########	Water	500ml plastic	1	METALS-DISS-	
							-		ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/24/2002	Water	plastic liter	0	TSS_	
RU1067-4	SW03PB	9/17/2002	9/19/2002	10/2/2002	###########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					******	Water	plastic liter	1	CHLORIDE	
					###########	Water	500ml plastic	1	METALS-DISS-	
							-		ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/24/2002	Water	plastic liter	0_	TSS	
RU1067-5	PW01PB	9/17/2002	9/19/2002	10/2/2002	###########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					##########	Water	plastic liter	1	CHLORIDE	

				;	######## Water	500ml plastic	1	METALS-DISS- ILM04.0			1
ļ					9/24/2002 Water	amber liter	2	SVOA-OLM04.2			- 1
- 1					9/24/2002 Water	plastic liter	0_	TSS	_	 _	
RU10	67-6 SW04TBP	B 9/17/2002	9/19/2002 1	10/2/2002	9/29/2002 Water	40ml vial	3	VOA-OLM04.2-5ML	PPS 489**		



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Phone: (919) 379-4000 Fax: 4050

Customer: O & M

Project: MARION BRAGG

Quote: Q1067

Internal Log-In Chain-of-Custody Report For Samples Received: 09/19/2002

Project Manager: Rodney Raimonde

919-379-4018

rraimonde@compuchemlabs.com

	Client	Collect	Receive	Due	Hold				_	-
Lab ID	Sample ID	Date	Date	Date	Date	Matrix	Media	#	Analysis	Comments
RV1067-1	SW02PB	9/17/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-10	GW06PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-11	GW07PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-12	GW08PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-13	GW08DPPB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-14	GW09FBPB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-15	PW01PB	9/17/2002	9/19/2002	10/2/2002		Water		Ô	SUBCONTRACT	SUB COD TO CET
RV1067-2	SW03PB	9/17/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-3	SW01PB	9/17/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-4	SW01DPPB	9/17/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-5	GW01PB	9/18/2002	9/19/2002	10/2/2002		Water		_ 0	SUBCONTRACT	SUB COD TO CET
RV1067-6	GW02PB	9/18/2002	9/19/2002	10/2/2002		Water		0_	SUBCONTRACT	SUB COD TO CET
RV1067-7	GW03PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-8	GW04PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-9	GW05PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET

Login Chain of Custody Report (In01)

Sep. 19, 2002

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Login Number: RU1067

Account: O & M

O & M

Page: 1 of 1

Project: MARION BRAGG

Case: Q1067

Laborato	-	Client		Collect	Receive		Due	
Sample N	lum	ber Sample Nu	mber	Date	Date	PR	Date	Comments
RU1067-1		SW01PB		17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**USE FOR QC
Water	s	AMMONIA (AS N)	Hold:	15-OCT-02	plastic liter	3	Bottles	
Water	s	CHLORIDE	Hold:	15-OCT-02	plastic liter	3	Bottles	
Water	s	METALS-DISS-ILM04.	Hold:	15-OCT-02	500ml plastic	3	Bottles	
Water	s	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	6	Bottles	
Water	s	TSS	Hold:	24-SEP-02	plastic liter			
Water	S	VOA-OLM04.2-5ML	Hold:	29-SEP-02	40ml vial	8	Bottles	
RU1067-2		SW01DPPB		17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	15-OCT-02	plastic liter	1	Bottles	
Water	s	CHLORIDE	Hold:	15-OCT-02	plastic liter	1	Bottles	
Water	s	METALS-DISS-ILM04.	Hold:	15-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	
Water	s	TSS	Hold:	24-SEP-02	plastic liter			
Water	s	VOA-OLM04.2-5ML	Hold:	29-SEP-02	40ml vial	3	Bottles	
RU1067-3		SW02PB		17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	15-OCT-02	plastic liter	1	Bottles	
Water	s	CHLORIDE	Hold:	15-OCT-02	plastic liter	1	Bottles	
Water	s	METALS-DISS-ILM04.	Hold:	15-OCT-02	500ml plastic	1	Bottles	
Water	s	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold:	24-SEP-02	plastic liter			
RU1067-4		SW03PB		17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	15-OCT-02	plastic liter	1	Bottles	
Water	s	CHLORIDE	Hold:	15-OCT-02	plastic liter	1	Bottles	
Water	s	METALS-DISS-ILM04.	Hold:	15-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold:	24-SEP-02	plastic liter			
RU1067-5		PW01PB		17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	15-OCT-02	plastic liter	1	Bottles	
Water	s	CHLORIDE	Hold:	15-OCT-02	plastic liter	1	Bottles	
Water	s	METALS-DISS-ILM04.	Hold:	15-OCT-02	500ml plastic	1	Bottles	
Water	s	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	
Water	s	TSS	Hold:	24-SEP-02	plastic liter			
RU1067-6		SW04TBPB	<u> </u>	17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	VOA-OLM04.2-5ML	Hold:	29-SEP-02	40ml vial	3	Bottles	

Signature: Salary Clarorch

Date: 9/19/02

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Login Chain of Custody Report (In01)

Sep. 19, 2002

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Page: 1 of 2

Login Number: RW1067

Account: 0 & M

O & M

Project: MARION BRAGG

Case: Q1067

				ase: Q1007				
Laborator	-	Client		Collect	Receive		Due	_
Sample N	um	ber Sample Nui	nber	Date	Date	PR	Date	Comments
RW1067-1		GW01PB		18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.	Hold:	16-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold:	25-SEP-02	plastic liter			
RW1067-2		GW02PB		18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.	Hold:	16-OCT-02	500ml plastic	1	Bottles	
Water	s	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	j
Water	S	TSS	Hold:	25-SEP-02	plastic liter			
RW1067-3		GW03PB		18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	s	CHLORIDE	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	s	METALS-DISS-ILM04.	Hold:	16-OCT-02	500ml plastic	1	Bottles	
Water	s	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold:	25-SEP-02	plastic liter			
RW1067-4		GW04PB		18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	s	CHLORIDE	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	s	METALS-DISS-ILM04.	Hold:	16-OCT-02	500ml plastic	1	Bottles	
Water	s	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold:	25-SEP-02	plastic liter			
RW1067-5		GW05PB		18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.	Hold:	16-OCT-02	500ml plastic	1	Bottles	
Water	s	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold:	25-SEP-02	plastic liter			
RW1067-6		GW06PB		18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	16-OCT-02	plastic liter	1	Bottles	i
Water	s	CHLORIDE	Hold	16-OCT-02	plastic liter	1	Bottles	
Water	s	METALS-DISS-ILM04.	Hold:	16-OCT-02	500ml plastic	1	Bottles	
Water	s	SVOA-OLM04.2	Hold	24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold:	25-SEP-02	plastic liter			· · · · · · · · · · · · · · · · · · ·
								

Signature: Sushey Taurde

Date: 9/15/02 97



Login Chain of Custody Report (In01)

Sep. 19, 2002

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Page: 2 of 2

Login Number: RW1067

Account: 0 & M

O & M

Project: MARION BRAGG

Q1067

Laborator	v	Client		Collect	Receive		Due	
Sample N	•		nber		Date	PR	Date	Comments
RW1067-7		GW07PB	- 	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	c	AMMONIIA (AC AI)	Hold:	16 OCT 02	plantia liter	4	Bottles	
Į.		AMMONIA (AS N)		16-OCT-02	plastic liter			
Water		CHLORIDE		16-OCT-02	plastic liter		Bottles	
Water		METALS-DISS-ILM04.			500ml plastic		Bottles	
Water		SVOA-OLM04.2		24-SEP-02	amber liter	2	Bottles	
Water		TSS		25-SEP-02	plastic liter			
<u> </u>	<u>s</u>	VOA-OLM04.2-5ML	Hold:	29-SEP-02	40ml vial		Bottles	
RW1067-8		GW08PB		18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	s	METALS-DISS-ILM04.	Hold:	16-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	
Water	s	TSS	Hold:	25-SEP-02	plastic liter			
Water	s	VOA-OLM04.2-5ML	Hold:	29-SEP-02	40ml vial	3	Bottles	
RW1067-9		GW08DPPB		18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	s	CHLORIDE	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	s	METALS-DISS-ILM04.	Hold:	16-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold:	25-SEP-02	plastic liter			
Water	S	VOA-OLM04.2-5ML	Hold:	29-SEP-02	40ml vial	3	Bottles	
RW1067-10		GW09FBPB		18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	AMMONIA (AS N)	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold:	16-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.	Hold:	16-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold:	24-SEP-02	amber liter	2	Bottles	
Water	s	TSS	Hold:	25-SEP-02	plastic liter			
Water	S	VOA-OLM04.2-5ML	Hold:	29-SEP-02	40ml vial	3	Bottles	
RW1067-11		GW10TBPB	-	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	s	VOA-OLM04.2-5ML	Hold:	29-SEP-02	40ml vial	3	Bottles	

Signature : __

Date : ___

: Nadang Jamond 8

COMPUCIEM al ... son ibe Mai COMMERCIAL RECEIVING LOG PPS/RFA Fed 4/84 Rec'd Date: 9/19/0.2 BAM Id Ex Courier: Lab Instructions MALICA BLASY * USC FOR OC Airbill No. 9253 6077 9019 C\$1067 RW 1067 un No. contract? Report 2013 T Verbal oler Rec'd By: Parameters Hodry 1 Clairwile nple Login By: nperature: 4,0-6,5 anide Samples checked for sulfide & chlorine? Y / NA Isva (min) Y /(NA) enol Samples checked for chlorine? ceived in Good Condition? (V) 'γο^c 10, explain: No. & No. & mpuChem Client ID Matrix Date Military р Н p H No. & No. & р Н No. & 2002 Type Type Type Турс Ήſ Type Type Н Ĉ Type ID Time Type Н 201017-1 GWOI PB 09 18 67:40 2-AL 1-500mck-WA 2 640278 64031B 68 50 GWOY PB 09:30 Give 5 PB GWUBPB 10 :70 2 GW07(B :45 3.40m L GW08/B * 3-201/42/3 PL 12:30 6 AL 3PL 19-40ML GWO8DP PB 1 Sound 42 17 PL 72 2AL 12 36 13 40mL GWOGF67B 14 10 GW 10 TB ?B 14:05 Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER 6/28/01 dec

Internal Chain of Custody

RAW SAMPLE

Laboratory:

Wetchem

Matrix: 420

Request Date:

9/23/02

Comments:

		CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)
V	1	RW1067-1	9/19/02	TSS		/ of /
	2	RW1067-2	9/19/02	TSS		# of /
V	3	RW1067-3	9/19/02	TSS		l of j
سا	4	RW1067-4	9/19/02	TSS		1 of \$
V	5	RW1067-5	9/19/02	TSS		A of A
V	6	RW1067-6	9/19/02	TSS		/ of /
V	7	RW1067-7	9/19/02	TSS		# of #
V	8	RW1067-8	9/19/02	TSS		3 of 3
. V	2	RW1067-9	9/19/02	TSS		l of /
- i/	10	RW1067-10	9/19/02	TSS		A of I
	11					of
	12		· · · · · · · · · · · · · · · · · · ·			of
	13					of
	14					of
	15	 	• DEV	OTES ENTIRE SAMPLE L	SED	of
	16		AN	ID BOTTLE DISPOSED O	5.	of
	17	· · · · · · · · · · · · · · · · · · ·	<u> </u>			of
	18					of
	19					of
	20					of

Relinquished By: Whichwo Johnson	n Date: 5-23-62	Received By:	Date: 9.23-02
Relinquished By: Many Many	Date: 1-13-6L	Received By: Cooler # 1	Date: 9 ሂታ ላጊ
Relinquished By:	Date:	Received By:	Date:

Internal Chain of Custody

RAW SAMPLE

Laboratory:

Wetchem

Matrix: H_2O

Request Date:

9/26/02

Comments:

П	CCN	Receipt	Analysis	Preservative	Bottle Number
Ш		Date	Parameter	(FOR ALL)	(receiving use only)
1	RW1067-1	9/19/02	AMMONIA (AS N)	Hasoy	l of
2	RW1067-2	9/19/02	AMMONIA (AS N)		0
3	RW1067-3	9/19/02	AMMONIA (AS N)		0
4	RW1067-4	9/19/02	AMMONIA (AS N)		o
5	RW1067-5	9/19/02	AMMONIA (AS N)		af
6	RW1067-6	9/19/02	AMMONIA (AS N)		ø f
7	RW1067-7	9/19/02	AMMONIA (AS N)		∑6f
8	RW1067-8	9/19/02	AMMONIA (AS N)		2 of 3
9	RW1067-9	9/19/02	AMMONIA (AS N)		l of (
10	RW1067-10	9/19/02	AMMONIA (AS N)		Df .
11			·		of
12					of
13					of
14	<u></u>				of
15					of
16					of
17					of
18					of
19					of
20					of

Relinquished () / ///	1 /	Received	
Relinquished Shifty	Date: 1/26/67	By: State	Date: 9-26-02
	/ /	0-/-	
Relinquished	•	Received (
By: Vary Tay	Date: 1-27-0r	By: cools #	Date: 9-27-02
	,		
Relinquished ^C		Received	
By:	Date:	By:	Date:

Internal Chain of Custody

RAW SAMPLE

Laborat	tory:
---------	-------

Wetchem

Matrix: H_{20}

Request Date:

9/24/02

Comments:

_			CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)	
	4	1	RW1067-1	9/19/02	CHLORIDE	NONE	₽ of /	PL. Liter
_	را	2	RW1067-2	9/19/02	CHLORIDE		N of I]]
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_	1	4	RW1067-4	9/19/02	CHLORIDE		1 of /	/
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Relinquished By: Whichus Johnson		Received By: Your W	Date: 9-24-02
Relinquished By:	Date: 9-27-02	Received By: Woler #1	Date: <u>4-27-02</u>
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COMPUCHEM	Project	Name:		^					ed to:	C E	7			Comp	uChen	n point-c	f-contact; (4)	DENC	Bxd	
a division of Liberty Analytical Corp.		MAF	104	Bene	38		Contac	t:						1					. /	
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501 Madison Avenue	Report	style: \	1,7	1. 0													_			
Cary, NC 27513	L		3 TA	TACH	Sigl		Phone:	<u> </u>						Samp	oling co	mplete?	ØorN (se	ee Note 1)		
1-800-833-5097		quireme	nt:		0			Locale	(state)							ifio (PS	or Batch (B)	QC?		
	rip Blank	ζ		BOX #2				ce Only		ŀ	BOX #			BOX 1			BOX #5			
2. Ground Water 7. 0						O ₃ + Ice		Other		Ì		Filtered			H- H	-		C- CLP	T- TCLP	
	Vaste					OH + ice		laHSO ₄ +			U-	Unfilter	ed	1		fe dium		S- SW-846		
4. Rinsate 9. 0 5. Soil / Sediment / Slud	Other			ļ		SO ₄ + Ice preserve		nAc+NaO lethanol	H + ICE						L- Lo	ow		W- CWA 6 O- Other	00-series	
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Note (1) If "N" lab should batch samples to await remainder of project - maximizing batch size and minimizing QC ratio; if "Y" lab should begin processing batches now.

Note (2) Samples should be stored 60 days after date report mailed at no extra charge.

Note (3) All lab copies of data should be retained for a minimum of 3 years.

COMPUCHEM	<u> </u>	-ioot	Namo:	SOR	CONT	RACI				ed to:			<u>) </u>	····	Compi	Chom	ina a	of contact. (4)		- 0	,
a division of Liberty Analytical Corp.	Pro)Ject	Name:	16n	BRA	60		Contac		ed to. Z	. 2							of-contact: (4)		e byro	7
a division of Closity Analytical Corp.	TA.	T:		-)		00		Addres							Phone:	(919) 3	79-4	100 x 400 050	9		
			, -	3 d	94										Fax: (919) <u>379-</u>	40	010			
501 Madison Avenue	Rep	•	style:	dat	$\sqrt{\Sigma}_{A}$	ckag	. .	Phone:	7 5						Sampli	na compl	loto?	Or N (see	Note 1		
Cary, NC 27513 1-800-833-5097	Dis	k rec	quireme		1 17	C) 1.38			Locale	(state)								or Batch (B)			
BOX #1 Surface Water 6. T		Blank			BOX #2	A. HC			e Only	(51515)	В	OX #3			BOX #4		W. 9	BOX #5			
BOX #1 Surface Water 6. T Ground Water 7. C					1		1O ₃ + Ice				-		Itered	. 1		H- High			C- CLP	T- TCLP	
3. Leachate 8. W 4. Rinsate 9. O							iOH + lce SO₄ + lca		laHSO₄ + nAc+NaO		ŀ	0- 0	nfiltere	╸		M- Medi	um		S- SW-846 W- CWA 60		
5. Soil / Sediment / Slud						E. Un	preserve	d J. M	ethanol										O- Other _		
				Box #1	Box #2	Box #3	Box #4	Box #5			PA	RAM	ETER	s							
Sample ID	20	Date / Year	Time	Matrix	Preservative	Filtered / Unfiltered	Expected Conc.	Method	of Bottles	Use for Lab QC (MS or DUP)	COD					CCN			marks / ((see Note	Comments es 2 & 3)	s
GWOSPB			15:00	WA	1		_ W		1	<u> </u>	V		+		RUI	067 -	1	200 672			
0688	Ľ		10:30						1		1						2	77			
07 PB			11:45						1		1						3	74			
0876			2:30						3	*	1					<u>-</u>	Y	75			
OSDPPB	L		12:30						1		1						5	76			
09 FBPB	J	1	14:10	1	14				1		1				1		6	77			
0178	9	81	69.40			<u> </u>			1		1						7_	70			_
02 (β			08:15			<u> </u>			1		1					,	8	71			
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OYPO	d	r	09:30	V	1				1	<u> </u>					\	1	0	81			
Clients Special Instructions:																		Te	mperatur	e <u> </u>	_°C
Lab: Received in good condit	ion'	? Y	or N	Desc	ribe any	/ proble	ms:	/-				4		,				·			
#1 Relinquished by:(sig)	21	ليلا	yn,			#2 Relin			th	1	<u> </u>	Date:	7/19	Relin	nquished	by:(sig)				Date:	
Company Name:	1	2	han		_ /		ny Name		53			Time .	105	Com	pany Na	ame:			 .	Time:	
#1 Received by:(sig)	9	1		Date:		1	eived by:		U.X.	1						by:(sig)				Date:	
Company Name:	<u>ع</u> -			Time:		Compa			سريرا	VI lab abaut		Time:	1615	Com	pany N	ame:				Time:	

Note (1) If "N" lab should batch samples to await remainder of project - maximizing batch size and minimizing QC ratio; if "Y" lab should begin processing batches now.

Note (2) Samples should be stored 60 days after date report mailed at no extra charge.

Note (3) All lab copies of data should be retained for a minimum of 3 years.

Note (4) Please call point-of-contact to verify receipt of samples.

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Į	Lab: Red	eived	in G	ood C	ond	ition'	? Y	or N		Descri	be Pr	oble	ms, If a	ıy:															<u></u>	la	<u>P,</u>		
	#1 Relind	uishe	d By:	(Sig)	4).{	24	B			Date	9	18/09	#2 Reli	nquished	By: (S	ig)					Date	e:		1	ß R	elingu	ishe	d By	/: (Si	g)	Dat	e:
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Date:

Time:

Company Name: Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now. Note (3): All lab copies of data destroyed after three years. Note (2): Samples stored 60 days after date report mailed at no extra charge.

Date:

Time:

#3 Received By: (Sig)

Company Name:

Date: 9 / (9/0 z #2 Received By: (Sig)

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СомриСні	EM P	roject Name	,					Addres				<u>a</u> (Poin	t-of	-Cor	ntact P.B. ton
a division of Liberty Analytica		Mar	ion (3rac	u.			03										
501 Madison Avenue	C	arrier : -e						NOV	1.3		V			1	Tele	pho	ne h	10:317718.3686
Cary, NC 27513 1-800-833-5097		rbill No. : 8		607	790	79					и.	. `)	Sam	plir	ng c	omplete? (Yer N (see Note 1)
1-000-033-3037		ampier Nam		-	$\overline{}$		Sample	r Signal	ture :		Mr.	<i>72</i>	<u> </u>		Proje	ect-	spec	cific (PS) or Batch (B) QC ?
BOX #1 1. Surface Water 6	. Trip Blank	BOX	Z A. HCI	+ Ice	F. Ice O	nly		BOX #3	F.	Filtere	d	E	30x #4		H. HI	igh		Box #6 C, CLP 3/90 T. TCLP
2. Ground Water 7	ON		8. HNO	3 + ice	G. Othe	·			U.	Unfilte	red	-			M. M	edit.	m	S. SW-846
3. Leschate 8	. Waste	,			H. NaHS				6	s - e	Yh	.]			L. Lo	W		W. CWA 600-series
	. Other	-	D. H2S	04 + Ice	I. ZnAc	NeOH +	los											O. Other
5. Soil / Sediment / Sludge	·	L	E. Unpr	reserved	8:7	i de la	ノトト										_	
Sample ID (9 characters maximum)	Date:Year_2009	Matrix Matrix	1 Box #2	Box Dariesed / Unfiltered	Expected Conc.		of Bordes	Use for Lab QC (MS or DUP)	YOA	Pesticida	PCB Harbicide	Metals / Mercury	Cyanide TOC / TOX	OEG / TPH	М	CA: HA	15/61	Remarks / Comments (see Notes 2 & 3)
SDOOPBI	9,1719	sa I	Z.	В	L	2/3	6		3			X			X	X	X	BNA - TCO
51WU31PB	1/1/16	5:05	1)	1	1 6		11			(11		ì			1	metals-HDOZ+ICE
5W01PB	- T - F 1	#15		17	11		4	,	X									COD-H-SON+ICE
SWOIDPRB	1,11				\prod		ξ		1									NHZN. HSON+I
SWOIMSPB	1			1			5											755/C1-14
SWOINSDPB	1,11	11					13		1									
GWOIPB	9/1801	140 2					b'								\prod			
GWO2PB	7	45			17							\prod			\prod	П	\prod	
GW03PB		330	11		11							\prod		1				
GW04PB	-111	130 1	1	1	1	1	1		1	1		1			1	1	1	
Clients Special Instructions:			of (cole	, , , 2	101	4 4	Sur	مط	وح	on	Co	<u>C</u>	.Ω:	لم	يد	حوا	Temperature 4, 0-6, 9
Lab: Received in Good Condition?		escribe Prob												V		©	Test) `
#1 Relinquished By: (Slg) W.P.			18/02		nquished	By (Sig)				De	le:		#3 R	elinqu	ishe	d By	: (Sig	Date:
Company Name: OANT			(800	ŧ.	ny Name:					Tin	ne:		Comi	pany	Name	e :		Time.
#@Beceived By: (Sig)	belle	Date:	4/1/0	#2 Rec	elved By	(Sig)				Da	le:		#3 R	eceiv	ed By	y: (S	ig)	Date:
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a division of Liberty Analytical Corp.		Jack	in B	rages				303	2	IX	die	inc	ای	-				1	ete Guston	\
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BOX #1 1. Surface Water 6. Trip 8la	nk	BOX #2	A. HCI		F. Ice O	-		BOX #3		. Filter			Во	x #4	H	ł. Hi	gh		Box #6 C. CLP 3/90	T. TCLP
2. Ground Water 7. Oil			B. HNO		G. Othe			1		J. Unfil							ediun	n	S. SW-846	
3. Leachate 8. Waste	- \ \			H + Ice		SO4 + Ica			1	B-G	ات	5			L	Lo	N		W. CWA 600)-series
4. Rinsate 9. Other_	7414			04 + Ice	1. Znac	* D + C	ice 	1											O. Other	
5. Soil / Sediment / Sludge		<u> </u>	E. Unpr	eserved				<u>. </u>												
Sample ID (9 characters maximum)	Time	Matrix Matrix	Preservative oo	Fittered / Unfittered og 8 x x x x x x x x x x x x x x x x x x	Expected Conc. og	Wethod	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC Pesticide	РСВ	Herbicide	Wetdis / Metoury Cyanide	TOC / TOX	0&G / TPH	200	いまった	5)23	Remarks / Co	
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GW08PB 1	1230		X	B			9		X	\coprod						Ш			COD - Has	Oy + I (0
GWO 8DPPB /	111								11	Ш_									NH2N-H2	SAITCE
GWOEMSPB /														\prod		\prod			TES C1 - 7	Ece,
GWO8MSDPB 1	11:1	1	1	1			1		11				Π	П		1	1	Π		
SWO 4TBPB 1	1400	رب	A	u			3		X								-			
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Lab: Received in Good Condition? Y or N			ems, if a		*		ten	<u> </u>		4					<u>. v</u>	1		Ta		
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Company Name: OAM Inc		Time:	800	Compa	ny Name:					Tir	me:		Co	mpan	y Na	me:				Time:
#1 Received By: (Sig)	er_		-1	#2 Rec				<u> </u>		Da	ite:	_	#3	Rece	ved	Ву: ((Sig)			Date:
Company Name: Comput	hem	Time:	0900	Compa	ny Name:			· .		Tir	me:		Co	mpar	y Na	me:				Time:

N (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.

Note (2): Samples stored 60 days after date report mailed at no extra charge.

Note (3): All lab copies of data destroyed after three years.

APPENDIX B Trillium, Inc. Data Validation Reports



DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

ORGANIC ANALYSIS DATA Volatiles in Water

SDG Nos. RU1067 and RW1067 September 2002 Sample Collections

Chemical Analyses Performed by:

CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

November 75, 2002

92241/CAE/DAS VMARION\Sept02\voc



EXECUTIVE SUMMARY

Validation of the volatile organics analysis data prepared by CompuChem Environmental for five water samples, one field blank, and two trip blanks from the Marion Bragg Landfill site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in two separate data packages, under Sample Delivery Group (SDG) Nos. RW1067 and RU1067, which were received for review on October 4, 2002. The following samples were reported:

SDG No. RW1067:

GW08PB (MB-1)

GW08DPPB (MB-1D)

GW07PB (MB-2)

GW09FBPB (field blank)

GW10TBPB (trip blank)

SDG No. RU1067:

SW01PB (SW-1)

SW01DPPB (SW-1D)

SW04TBPB (trip blank)

Findings of the validation effort resulted in the following qualifications of reported sample results:

- Results for methylene chloride in all samples were qualified as less than the contract required quantitation limit and as estimated (10 UJ).
- Results for acetone in SW04TBPB and for chloromethane in GW09FBPB were qualified as estimated (J).
- Results for toluene in all samples were qualified as less than the contract required quantitation limit (10 U).
- The result for acetone in GW07PB was qualified as less than the contract required quantitation limit and as estimated (10 UJ).
- Results for trichloroethene and chlorobenzene in GW08PB were qualified as estimated (J, UJ).
- The result for carbon disulfide in SW01DPPB was qualified as not detected at the CRQL (10 U).
- The TIC peak at approximate RT 15.3 minutes in SW01PB, SW01DPPB, GW07PB, GW08PB, and GW10TBPB was rejected (R)
- The TIC peak reported at RT 14.3 minutes in SW01PB was rejected (R).



All "B" qualifiers, applied by the laboratory to indicate the presence of an analyte in the associated method blank, were removed by the validator. Laboratory-applied "J" qualifiers were not removed by the validator except where superceded by validator-applied qualifiers.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIV). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues observed in the data packages are discussed in Section XIII.

This validation report should be considered <u>part of both data packages</u> for all future distributions of the volatiles data.



INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis (OLM04.2). Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used to denote specific information regarding the analytical results.

Validation was performed in accordance with the USEPA "Contract Laboratory Program National Functional Guidelines for Organic Data Review" (EPA 540/R-99/008, 10/99). The EPA Region II Standard Operating Procedure HW-6 (Rev. 11), "Evaluation of Organics Data for the CLP," (6/96) was also considered during the evaluation and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with the National Functional Guidelines:

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
- NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.



R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

These codes are recorded on the customized data tables in Attachment A and the laboratory's Organic Analysis Data Sheets (Form I, Attachment B) to qualify the results as appropriate according to the review of the data packages.

Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The water samples and associated blanks were collected on 9/17-18/02. All sample analyses were performed on 9/25-26/02, which is within the specified holding time for chemically-preserved water samples. Acceptable pH values of 1 were determined by the laboratory at the time of analysis for each sample, confirming successful chemical preservation. Sample pHs were not documented directly on the chain of custody (COC) records, but were recorded on Water Batch Sheets provided in both data packages.

Acceptable cooler temperatures (4-6°C) on receipt at the laboratory were recorded on both COC records applicable to these samples. The same temperatures were also recorded on the laboratory's receiving logs in both data packages.

Sampler notations on each COC indicate that the samples for volatiles analysis were preserved with hydrochloric acid and iced. The narratives in both data packages further state that, with the exception of one broken 40-mL vial for SW01PB, all samples were received intact and properly refrigerated.

II. GC/MS Instrument Performance Checks

Four instrument performance checks using bromofluorobenzene (BFB) were run and reported, representing every shift (12-hour period) on both instruments during which samples or associated standards and quality control samples were analyzed. Results for all four performance checks were acceptable.

III. Calibration

Sample analyses were performed on a single gas chromatograph/mass spectrometer (GC/MS) system identified as HP73. 2-Butanone, 1,2-dichloropropane, and dibromochloromethane were manually integrated in one of the calibration standards run on this instrument in association with this data set. Each manual integration was correctly performed, properly documented and accurately incorporated into the applicable quantitation report. No system monitoring or internal standard peaks were manually integrated.

The laboratory's storage blank only was analyzed on a second GC/MS system identified as HP59. Bromomethane was manually integrated in two of the standards run on this instrument in association with this data set. Each manual integration was correctly performed, properly documented and accurately incorporated into the applicable quantitation report. No system monitoring or internal standard peaks were manually integrated.



A. Initial Calibration (IC)

Two ambient purge ICs (9/17/02 on HP73 and 9/27/02 on HP59) were associated with the reported sample and quality control analyses. Documentation of all individual IC standards run was present in both data packages and relative response factor (RRF) as well as percent relative standard deviation (%RSD) values were correctly calculated and accurately reported. All RRF values were above the minimum acceptance criterion (0.05) in both ICs. %RSD values were below the 30% maximum acceptance criterion except for methylene chloride (33.0%) in the IC on HP73 and bromomethane (39.8%) in the IC on HP59.

Results for methylene chloride in all samples in this data set were qualified as estimated (J) based on the high %RSD in the associated IC on HP73. No site samples were associated with the IC on HP59, therefore no qualifiers were necessary based on the high %RSD for bromomethane.

B. Continuing Calibration (CC)

Reported site sample and quality control analyses were performed under two CC standards, (9/25/02-08:16 and 9/26/02-08:18) on HP73. The storage blank was analyzed immediately following the IC on HP59, and no separate CC standard was analyzed. Instead, the mid-point IC standard was evaluated by the laboratory and the validator against the CC standard criteria, as required by CLP.

Documentation of both CC standards and the mid-point IC standard presented as a CC standard was present in the applicable data packages and RRF as well as percent difference (%D) values were correctly calculated and accurately reported. All RRFs were above the 0.05 minimum criterion. %D values were less than the maximum acceptance limit of 25% except for acetone (36.4%) and 2-butanone (25.2%) in the 9/25/02-08:16 CC on HP73; dichlorodifluoromethane (37.6%), chloromethane (28.1%), acetone (35.4%), and 2-butanone (25.4%) in the 9/26/02-08:18 CC on HP73, and bromomethane (28.1%) in the mid-point IC standard on HP59.

Results for acetone in SW04TBPB and GW07PB and for chloromethane in GW09FBPB were qualified as estimated (J) because they were detected in samples associated with the CC standards which had elevated %Ds for these compounds.

No other positive results were reported for the target analytes listed above in the samples associated with the affected CCs, the RRFs were all acceptable (i.e., were greater than 0.05) in the affected CC standards, and the %Ds were not substantially above the acceptance criterion (i.e., were not greater than 50%). Therefore, no additional qualifiers were applied based on the CC standard results.



IV. Blanks

Three laboratory method blanks (MBs: VBLKAE, VBLKCG, and VBLKYS) were analyzed with the samples in this data set. Methylene chloride (9 μ g/L) and toluene (0.6 μ g/L) were detected in VBLKAE; dichlorodifluoromethane (0.5 μ g/L), methylene chloride (4 μ g/L), and toluene (0.8 μ g/L) were detected in VBLKCG; and acetone (3 μ g/L), methylene chloride (2 μ g/L), and toluene (1 μ g/L) were detected in VBLKYS. Results for methylene chloride and toluene in all samples were qualified as less than the contract required quantitation limit (CRQL, 10 U) because the reported values were less than five times the concentration found in the associated method blank. The "B" qualifiers applied by the laboratory to these results to indicate that these compounds were also present in the associated method blank were removed by the validator.

Dichlorodifluoromethane was not detected in any of the site samples and only the laboratory's storage blank was associated with VBLKYS. Therefore, no additional qualifiers were required based on method blank contamination.

One storage blank (VHBLKVU) was also analyzed in association with the site samples. Methylene chloride (1 μ g/L) and toluene (1 μ g/L) were detected in VHBLKVU. Results for both of these compounds in all samples were previously qualified based on associated method blank contamination, and no additional action was taken based on storage blank contamination.

Two trip blanks (GW10TBPB and SW04TBPB) and one field blank (GW09FBPB) were included in this data set. After qualifications based on laboratory blank contamination, acetone (6 μ g/L) was found in SW04TBPB and chloromethane (0.5 μ g/L) and trichloroethene (0.9 μ g/L) were found in GW09FBPB. Based on the available documentation, it is not possible to determine how the samples were organized into coolers for shipment to the laboratory, although it is apparent that at least two coolers were used. Therefore, for the purposes of this evaluation, both trip blanks were considered to be associated with all of the site samples, and the result for acetone in GW07PB was qualified as less than the CRQL (10 U) based on associated trip blank contamination.

Where detected in an associated sample, the concentration of trichloroethene was greater than five times the field blank concentration, and chloromethane was not reported in any of the samples associated with the field blank. Therefore, no additional sample results were qualified based on field-submitted blank contamination.

Tentatively identified compounds (TICs) found in all blanks associated with this data set are discussed in Section XI.

V. System Monitoring Compound Recoveries

Recoveries of the three system monitoring compounds (SMCs) in the reported results for all samples and blanks were correctly calculated, accurately reported and within the acceptance limits as documented on the summary forms.



VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Samples GW08PB and SW01PB were prepared and analyzed as MS/MSD pairs. Percent recoveries (%R) and relative percent differences (RPDs) between paired recoveries were correctly calculated and accurately reported for both sets of quality control data. The %Rs for all spiked target compounds were acceptable (94-106%) and reproducible (RPDs ≤4) in SW01PBMS/MSD. For GW08PBMS/MSD, recoveries for 1,1-dichloroethene, benzene, and toluene were acceptable (77-94%) and reproducible (RPDs ≤5), but recoveries for trichloroethene (66% and 52%; QC 71-120%) and chlorobenzene (66% and 64%; QC 75-130%) were unacceptably low. Chlorobenzene showed acceptable reproducibility (RPD 3), but the RPD for trichloroethene was high (24%; QC ≤14%).

In the unspiked analysis of GW08PB, chlorobenzene was not detected and trichloroethene was found at a concentration very close to the spike amount added (56 μ g/L; 50 μ g/L added). Accurate recovery should be achievable under these circumstances. Results for trichloroethene and chlorobenzene in GW08PB were qualified as estimated (J, UJ) on this basis.

A comparison of results for non-blank-related, unspiked target analytes in GW08PB, the MS, and the MSD was made. Agreement among the three results for vinyl chloride (13.9 %RSD) and cis-1,2-dichloroethene (13.3 %RSD) was acceptable. Carbon disulfide was detected at a low concentration (2 μ g/L) in the MSD but was not found in the MS or in GW08PB, and 1,2-dichloroethane was found at low concentrations in the MS (0.5 μ g/L) and in the MSD (1 μ g/L) but was not found in GW08PB. Since the positive results were all less than the CRQL and neither analyte was reported by the laboratory in the unspiked sample, no action was taken based on these inconsistent results.

A comparison of results for non-blank-related, unspiked target analytes in SW01PB, the MS, and the MSD was also made. 1,2-Dichloroethane was found at low concentrations in the MS (0.8 μ g/L) and in the MSD (1 μ g/L) but was not found in SW01PB. Since the positive results were both less than the CRQL and this analyte was not reported by the laboratory in the unspiked sample, no action was taken based on these inconsistent results.

The presence of 1,2-dichloroethane in all four spiked analyses at concentrations ranging from 0.5 μ g/L to 1 μ g/L and its absence in both unspiked sample analyses suggests that the spiking solution may be contaminated. The laboratory should be requested to investigate this situation and implement any necessary corrective actions as soon as possible.

VII. Field Duplicate

Sample GW08DPPB was identified as a field duplicate of GW08PB. Agreement between paired results for vinyl chloride (0 RPD), cis-1,2-dichloroethene (0 RPD), and trichloroethene (14.9 RPD) was acceptable.



Sample SW01DPPB was identified as a field duplicate of SW01PB. Carbon disulfide was reported at a very low concentration in SW01DPPB (0.9 $\mu g/L$) but was not detected in in SW01DPPB (10 U). The result for carbon disulfide in SW01DPPB was qualified as not detected at the CRQL (10 U) due to lack of confirmation at a very low concentration in the field duplicate analysis.

VIII. Internal Standard (IS) Performance

All IS areas and retention times were within documented quality control limits for the reported sample analyses.

IX. Target Compound Identification

All reported target analytes were correctly identified with acceptable supporting mass spectra present in the applicable data packages.

X. Compound Quantitation and Reported Detection Limits

Target compound concentrations and CRQLs were correctly calculated and accurately reported. No dilutions were required for any of the samples. Some target analyte peaks were manually integrated in some of the samples in this data set. In each case, the manual integration was correctly performed, properly documented, and accurately incorporated into the applicable quantitation report.

"J" qualifiers were appropriately applied by the laboratory to the sample Form Is when the concentration of an analyte was less than the sample-specific quantitation limit. Except where superseded by another qualifier (e.g., "U" at the CRQL), these "J" qualifiers were not removed by the validator.

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation. Sample-specific quantitation limits may be found on the laboratory-generated Form I for each sample (Attachment B) as well as on the data tables.

XI. Tentatively Identified Compounds (TIC)

Library searches were performed as required for the samples in this data set. A laboratory artifact at approximate retention time (RT) 15.3 minutes was reported in VBLKAE and VBLKCG; a laboratory artifact peak with a very similar mass spectrum was also reported in VBLKYS and in



VHBLKVU at RT 15.1 minutes. A second artifact peak was reported in VBLKYS and VHBLKVU, at RT 13.2 minutes; this peak was tentatively identified as a siloxane (column bleed) compound.

Based on its presence in the associated method blank and its identification as a laboratory artifact, the TIC peak at approximate RT 15.3 minutes in SW01PB, SW01DPPB, GW07PB, GW08PB, and GW10TBPB were rejected (R).

A second TIC peak was reported in SW01PB, at RT 14.3 minutes. Although not reported in the associated MB, a peak was present in the MB chromatogram at the same RT. In addition, the mass spectrum for the sample peak suggests a siloxane (column bleed) compound. Therefore, based on professional judgment, the TIC peak reported at RT 14.3 minutes in SW01PB was rejected (R).

No other TICs were reported in any of the samples in this data set.

XII. System Performance

The GC/MS systems appear to have been working satisfactorily at the time of these analyses, based on review of the available raw data.

The presence of 1,2-dichloroethane in all four spiked analyses at concentrations ranging from 0.5 μ g/L to 1 μ g/L and its absence in both unspiked sample analyses (see Section VI) suggests that the spiking solution may be contaminated. The laboratory should be requested to investigate this situation and implement any necessary corrective actions as soon as possible.

XIII. Documentation

Two chain of custody (COC) records applicable to these samples were provided for review. The following issues were noted:

- Analysis of VOCs was not specified on the COC for SW01PB and SW01DPPB.
- A second, facsimile copy of COC #061476 was also included. The facsimile was signed by the same person and showed the same date/time of laboratory receipt as the "original." However, the two signatures are not identical and the facsimile does not contain two laboratory notations regarding sample condition on laboratory receipt that are on the "original." No explanation for this additional copy of one of the COC records was provided by the laboratory.
- Despite a specific request on the COCs, sample pHs on laboratory receipt were not recorded on the COCs.



- Copies of the courier airbills were not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on each COC record.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

No traffic reports (COCs and laboratory receiving logs and reports) were included in the data package for SDG No. RW1067. The applicable pages from the data package for SDG No. RU1067 were copied and inserted into the RW1067 package as pages 55A-55H by the validator.

These documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XIV. Overall Assessment

Results for volatile compounds in the samples reported in SDG Nos. RU1067 and RW1067 were qualified as follows based on the validation effort:

- Results for methylene chloride in all samples were qualified as less than the contract required quantitation limit based on contamination in the associated method blanks and as estimated based on a high %RSD in the associated IC (10 UJ).
- Results for acetone in SW04TBPB and chloromethane in GW09FBPB were qualified as estimated (J) based on unacceptably high %Ds in the associated CC standards.
- Results for toluene in all samples were qualified as less than the contract required quantitation limit (10 U) based on contamination in the associated method blanks.
- The result for acetone in GW07PB was qualified as less than the CRQL based on associated trip blank contamination and as estimated due to an elevated %D in the associated CC standard (10 UJ).



- Results for trichloroethene and chlorobenzene in GW08PB were qualified as estimated (J, UJ) due to unacceptably low recoveries in the matrix spike analyses.
- The result for carbon disulfide in SW01DPPB was qualified as not detected at the CRQL (10 U) due to lack of confirmation at a very low concentration in the field duplicate analyses.
- The TIC peak at approximate RT 15.3 minutes in SW01PB, SW01DPPB, GW07PB, GW08PB, and GW10TBPB was rejected (R) based on the presence of a comparable peak in the associated method blank and its identification as a laboratory artifact.
- The TIC peak reported at RT 14.3 minutes in SW01PB was rejected (R) based on professional judgment and its identification as a laboratory artifact.

All "B" qualifiers, applied by the laboratory to indicate the presence of the analyte in the associated method blank, were removed by the validator. Laboratory-applied "J" qualifiers were not removed by the validator except where superceded by validator-applied qualifiers, as noted above.

Documentation issues observed in the data packages are discussed in Section XIII.

This validation report should be considered <u>part of both data packages</u> for all future distributions of the volatiles data.



ATTACHMENT A

DATA TABLES
SDG Nos. RU1067 and RW1067
Volatiles in Water - Marion Bragg, September 2002

Marion Bragg Landfill - September 2002 - Volatiles in Ground and Surface Waters

Results are in ug/L

Collection Point =========		MB-1	MB-1D	MB-2	Field Blank
Sample ID =======>>		GW08PB	GW08DPPB	GW07PB	GW09FBPB
Lab Sample No. ===========		RW1067-8	RW1067-9	RW1067-7	RW1067-10
Collection Date. ===========		9/18/02	9/18/02	9/18/02	9/18/02
	CRQL				
Dichlorodifluoromethane	10	10 U	10 U	10 U	10 U
Chloromethane	10	10 U	10 U	10 U	0.5 J
Vinyl Chloride	10	0.9 J	0.9 J	10	10 U
Bromomethane	10	10 U	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U	10 U	10 U
Acetone	10	10 U	10 U	10 UJ	10 U
Carbon Disulfide	10	10 U	10 U	0.4 J	10 U
Methyl acetate	10	10 U	10 U	10 U	10 U
Methylene chloride	10	10 UJ	10 UJ	10 UJ	10 UJ
trans-1,2-dichloroethene	10	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U	10 U	10 U
cis-1,2-dichloroethene	10	5 J	5 J	3 J	10 U
2-Butanone	10	10 U	10 U	10 U	10 U
Chloroform	10	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 U	10 U
Cyclohexane	10	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 U	10 U
Benzene	10	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 U	10 U
Trichloroethene	10	56 J	65	10 U	0.9 J
Methylcyclohexane	10	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U	10 U	10 U
Toluene	10	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 U	10 U
2-Hexanone	10	10 U	10 U	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U	10 U	10 U
Chlorobenzene	10	10 UJ	10 U	1 J	10 U
Ethylbenzene	10	10 U	10 U	10 U	10 U
Total Xylenes	10	10 U	10 U	10 U	10 U
Styrene	10	10 U	10 U	10 U	10 U
Bromoform	10	10 U	10 U	10 U	10 U
Isopropylbenzene	10	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U	10 U	10 U
	10	10 U	10 U	10 U	10 U
1.Z-Dichlorobenzene	10				
1,2-Dichlorobenzene 1,2-Dibromo-3-chloropropane	10	10 U	10 U	10 U	10 U

Marion Bragg Landfill - September 2002 - Volatiles in Ground and Surface Waters

Results are in ug/L

Collection Point ====================================	>	Trip Blank	SW-1	SW-1D	Trip Blank
Sample ID ========>		GW10TBPB	SW01PB	SW01DPPB	SW04TBPB
Lab Sample No. ===========		RW1067-11	RU1067-1	RU1067-2	RU1067-6
Collection Date. =============		9/18/02	9/17/02	9/17/02	9/17/02
Di-11	CRQL	40.11	40.11	40.11	40.41
Dichlorodifluoromethane	10	10 U	10 U	10 U	10 U
Chloromethane	10	10 U	10 U	10 U	10 U
Vinyl Chloride	10	10 U	10 U	10 U	10 U
Bromomethane	10	10 U	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U 10 U	10 U	10 U 10 U	10 U
Acetone	10 10	10 U	10 U 10 U	10 U	6 J
Carbon Disulfide		10 U		10 U	10 U
Methyl acetate Methylene chloride	10 10	10 UJ	10 U 10 UJ	10 U	10 U 10 UJ
metnylene chlonde trans-1,2-dichloroethene	10	10 UJ	10 UJ 10 U	10 UJ	10 UJ 10 U
Methyl tert-butyl ether	10	10 U	10 U	10 U	10 U
Methyl tert-butyl ether 1,1-Dichloroethane	10	10 U	10 U	10 U	10 U
cis-1,2-dichloroethene	10	10 U	10 U	10 U	10 U
cis-1,2-dichloroetherie 2-Butanone	10	10 U	10 U	10 U	10 U
Chloroform	10	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 U	10 U
Cyclohexane	10	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 U	10 U
Benzene	10	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 U	10 U
Trichloroethene	10	10 U	10 U	10 U	10 U
Methylcyclohexane	10	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U	10 U	10 U
Toluene	10	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 U	10 U
2-Hexanone	10	10 U	10 U	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U	10 U	10 U
Chlorobenzene	10	10 U	10 U	10 U	10 U
Ethylbenzene	10	10 U	10 U	10 U	10 U
Total Xylenes	10	10 U	10 U	10 U	10 U
Styrene	10	10 U	10 U	10 U	10 U
Bromoform	10	10 U	10 U	10 U	10 U
Isopropylbenzene	10	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U	10 U



ATTACHMENT B

ORGANIC ANALYSIS DATA SHEETS (Form I)
SDG Nos. RU1067 and RW1067
Volatiles in Water - Marion Bragg, September 2002

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

				GW08PB
Lab Name:	COMPUCHEM	Contract:	OLM04-REVS	MB-1

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-8

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-8A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. ____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

COMPOUND

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

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FORM I VOA-1

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA	SAMPLE	NO.
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	T 1 17	COMPAGNICA	-		GW08PB
-	Lab Name:	COMPUCHEM	Contract:	OLM04-REVS	İ

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-8

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-8A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

_	CAS NO.	COMPOUND	(ug/L or ug/Kg) <u>UG/L</u> Q
1	79-01-6	Trichloroethene	56 T
-	108-87-2	Methylcyclohexane	10 0
_	78-87-5	1,2-Dichloropropane	10 U
1	75-27-4	Bromodichloromethane	10 U
1-	10061-01-5	cis-1,3-Dichloropropene	10 U
•	108-10-1	4-Methyl-2-Pentanone	10 U
Τ.	108-88-3	Toluene	10 0.6 JB U
Ι.	10061-02-6	trans-1,3-Dichloropropene	10 U
-	79-00-5	1,1,2-Trichloroethane	10 U
_	127-18-4	Tetrachloroethene	10 U
T	591-78-6	2-Hexanone	10 U
- [124-48-1	Dibromochloromethane	10 U
_	106-93-4	1,2-Dibromoethane	10 U
_	108-90-7	Chlorobenzene	10 VUJ
	100-41-4	Ethylbenzene	10 U
1-	1330-20-7	Xylene (Total)	10 U
_	100-42-5	Styrene	10 U
T	75-25-2	Bromoform	10 U
	98-82-8	Isopropylbenzene	10 U
	79-34-5	1,1,2,2-Tetrachloroethane	10 U
	541-73-1	1,3-Dichlorobenzene	. 10 U
T	106-46-7	1,4-Dichlorobenzene	10 U
	95-50-1	1,2-Dichlorobenzene	10 Ü
•	96-12-8	1,2-Dibromo-3-Chloropropane	10 U
_	120-82-1	1,2,4-Trichlorobenzene	10 U
			14.6

CaE 11/7/02

CONCENTRATION UNITS:

FORM I VOA-2

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

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	GWORPR

EPA SAMPLE NO.

- Lab Name: COMPUCHE

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RW1067

Matrix: (soil/water) WATER

Lab Sample ID: RW1067-8

Sample wt/vol: 5

(g/mL) ML Lab File ID: RW1067-8A73

Level: (low/med)

LOW

Date Received: 09/19/02

% Moisture: not dec.

Date Analyzed: 09/26/02

GC Column: ZB-624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1

(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
- 1.	LABORATORY ARTIFACT	15.29	=======================================	JB ?
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FORM I VOA-TIC

1A VOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

Contract: OLM04-REVS

GW08DPPB MB-ID

- Lab Name: COMPUCHEM

Lab Code: LIBRTY

SAS No.:

Cag 11/7/07 SDG No.: RW1067

Matrix: (soil/water) WATER

Lab Sample ID: RW1067-9

Sample wt/vol: 5 (g/mL) ML

Lab File ID: RW1067-9A73

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture: not dec. _____

Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm)

Case No.:

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
75-71-8	Dichlorodifluoromethane	10 U	
74-87-3	Chloromethane	10 U	
- 75-01-4	Vinyl Chloride	0.9 J	
74 02 0	Dromomothano	10 17	

	74-87-3	Chloromethane	10	U
Τ_	75-01-4	Vinyl Chloride	0.9	J
	74-83-9	Bromomethane	10	U
,-	75-00-3	Chloroethane	10	U
	75-69-4	Trichlorofluoromethane	10	U
T_{-}	75-35-4	1,1-Dichloroethene	10	U
1	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	Ū
-	67-64-1	Acetone	10	∕Ū
	75-15-0	Carbon Disulfide	10	U
	79-20-9	Methyl Acetate	10	Ū
1_	75-09-2	Methylene Chloride	10 -2	- JB ルエ
	156-60-5	trans-1,2-Dichloroethene	10	Ü
	1634-04-4	Methyl tert-Butyl Ether	10	U
1	75-34-3	1,1-Dichloroethane	10	U
1-	156-59-2	cis-1,2-Dichloroethene	5	J .
	78-93-3	2-Butanone	10	Ū
Τ.	67-66-3	Chloroform	10	U
	71-55-6	1,1,1-Trichloroethane	10	U
	110-82-7	Cyclohexane	10	U
	56-23-5	Carbon Tetrachloride	10	U
T^{T}	71-43-2	Benzene	10	U
1 —	107-06-2	1,2-Dichloroethane	10	Ū

CaE 11/7/08

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.:

SDG No.: RW1067

Matrix: (soil/water) WATER

Lab Sample ID: RW1067-9

Sample wt/vol: 5 (q/mL) ML

Lab File ID: RW1067-9A73

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture: not dec. _____

Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm)

CAS NO.

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: ____(uL)

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

			
79-01-6	Trichloroethene	65	
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	Ū
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10 0.5	_JB- //
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	Ū
541-73-1	1,3-Dichlorobenzene	10	ับ
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
		Cag 117.1	2

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1F

OLATILE	ORGAN I	[CS	ANALYSIS	5 DATA	SHEET
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GW08DPPB Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-9

Sample wt/vol: 5 (g/mL) Lab File ID: RW1067-9A73 ML

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL) Soil Extract Volume: (uL)

CONCENTRATION UNITS:

EPA SAMPLE NO.

Number TICs found: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name:	СОМРИСНЕМ		Contract:	OLM04-REVS	GW07PB
Lab Code:	LIBRTY	Case No.:	SAS No.:		CAE 11/7/07 SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-7

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-7A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

_	CAS NO.	COMPOUND	(ug/L or ug/Kg) UG	<u>3/L</u> Q
1-	75-71-8	Dichlorodifluoromethane	10	Ū
_	74-87-3	Chloromethane	10	- 0
	75-01-4	Vinyl Chloride	10	
Τ–	74-83-9	Bromomethane		-u -
			10	
_	75-00-3	Chloroethane	10	Ŭ
	75-69-4	Trichlorofluoromethane	10	U
T_	75-35-4	1,1-Dichloroethene	10	Ü
1_	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
_	67-64-1	Acetone	10 -6	J UJ
_	75-15-0	Carbon Disulfide	0.4	J
	79-20-9	Methyl Acetate	10	U
-	75-09-2	Methylene Chloride	10 3	Lu at
	156-60-5	trans-1,2-Dichloroethene	10	Ū
_	1634-04-4	Methyl tert-Butyl Ether	10	U
1	75-34-3	1,1-Dichloroethane	10	Ū
1	156-59-2	cis-1,2-Dichloroethene	3	J
_	78-93-3	2-Butanone	10	Ū
T^{-}	67-66-3	Chloroform	10	U
1-	71-55-6	1,1,1-Trichloroethane	10	Ū
' —	110-82-7	Cyclohexane	10	U
	56-23-5	Carbon Tetrachloride	10	Ū
T	71-43-2	Benzene	10	Ū
-	107-06-2	1,2-Dichloroethane	10	Ū
_			20.6	· · · · · · · · · · · · · · · · · · ·

CaE 11/7/02

CONCENTRATION UNITS:

SAS No.:

EPA SAMPLE NO.

GW07PB

SDG No.: RW1067

- Lab Name: COMPUCHEM Contract: OLM04-REVS

Case No.:

Lab Code: LIBRTY

- Matrix: (soil/water) WATER Lab Sample ID: RW1067-7

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-7A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

_	CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q
1-	79-01-6	Trichloroethene	10 U
_	108-87-2	Methylcyclohexane	10 U
_	78-87-5	1,2-Dichloropropane	10 U
-	75-27-4	Bromodichloromethane	10 U
1-	10061-01-5	cis-1,3-Dichloropropene	10 U
_	108-10-1	4-Methyl-2-Pentanone	10 U
т_	108-88-3	Toluene	10 0.7 JB (1
-	10061-02-6	trans-1,3-Dichloropropene	10 U
. —	79-00-5	1,1,2-Trichloroethane	10 U
_	127-18-4	Tetrachloroethene	10 U
T	591-78-6	2-Hexanone	10 U
- -	124-48-1	Dibromochloromethane	10 U
_	106-93-4	1,2-Dibromoethane	10 U
	108-90-7	Chlorobenzene	1 J
-	100-41-4	Ethylbenzene	10 U
-	1330-20-7	Xylene (Total)	10 U
_	100-42-5	Styrene	10 U
_	75-25-2	Bromoform	10 U
	98-82-8	Isopropylbenzene	10 U
1 —	79-34-5	1,1,2,2-Tetrachloroethane	10 U
_	541-73-1	1,3-Dichlorobenzene	10 U
	106-46-7	1,4-Dichlorobenzene	10 U
	95-50-1	1,2-Dichlorobenzene	10 U
_	96-12-8	1,2-Dibromo-3-Chloropropane	10 U
	120-82-1	1,2,4-Trichlorobenzene	10 U
			44.6

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA	SAMPLE	NO.	

		TENIMITABLE	TRENTILIED COMPOUNDS	j.
				GW07PB
-	Lab Name: COMPUCHEM		Contract: OLM04-REVS	
				I ————————————————————————————————————

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-7

Sample wt/vol: 5 (g/mL) Lab File ID: RW1067-7A73 ML

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

- Lab Name: COMPUCHEM

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

·	GW09FBPB
Contract: OLM04-REVS	GWO9FBPB Held Blank

SDG No.: RW1067 Lab Code: LIBRTY Case No.: SAS No.:

Matrix: (soil/water) WATER Lab Sample ID: RW1067-10

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-10A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: CAS NO. (uq/L or ug/Kg) UG/L Q COMPOUND 75-71-8 10 Dichlorodifluoromethane Chloromethane 74-87-3 0.5 75-01-4 Vinyl Chloride 10 Ū 74-83-9 Bromomethane 10 U 75-00-3 Chloroethane 10 10 75-69-4 Trichlorofluoromethane 1,1-Dichloroethene 1,1,2-Trichloro-1,2,2-trifluoroethane 75-35-4 10 U 76-13-1 10 U 67-64-1 10 Acetone Carbon Disulfide Methyl Acetate 75-15-0 Ū 79-20-9 10 IJ 75-09-2 Methylene Chloride trans-1,2-Dichloroethene 10 156-60-5 Methyl tert-Butyl Ether 10 Ū 1634-04-4 75-34-3 1,1-Dichloroethane $\overline{10}$ Ū 156-59-2 cis-1,2-Dichloroethene 10 Ū 78-93-3 2-Butanone 10 67-66-3 Chloroform 10 1,1,1-Trichloroethane 71-55-6 10 Cyclohexane 110-82-7 10 56-23-5 71-43-2 10

Carbon Tetrachloride

1,2-Dichloroethane

Benzene

107-06-2

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1B VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE N

CONCENTRATION UNITS:

_	Lab	Name:	СОМРИСНЕМ			Contract:	OLM04-REVS	GW091	FBPB
	Lab	Code:	LIBRTY	Case	No.:	SAS No.	:	SDG No.:	RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-10

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-10A73

Level: (low/med) LOW Date Received: 09/19/02

Date Analyzed: 09/26/02 % Moisture: not dec.

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Aliquot Volume: (uL) Soil Extract Volume: ____(uL)

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L 79-01-6 0.9 Trichloroethene 10 108-87-2 Methylcyclohexane 78-87-5 1,2-Dichloropropane 10 Ū 75-27-4 Bromodichloromethane 10 10061-01-5 cis-1,3-Dichloropropene 10 Ū 4-Methyl-2-Pentanone 108-10-1 10 ij Toluene trans-1,3-Dichloropropene 108-88-3 10061-02-6 10 1,1,2-Trichloroethane 10 79-00-5 127-18-4 591-78-6 10 Tetrachloroethene Ū 10 2-Hexanone Dibromochloromethane $\overline{10}$ 124-48-1 106-93-4 1,2-Dibromoethane 10 108-90-7 Chlorobenzene $\overline{10}$ 100-41-4 Ethylbenzene 10 Ū 1330-20-7 Xylene (Total) 10 100-42-5 Styrene $\overline{10}$ Ū 75-25-2 Bromoform 10 Ū Isopropylbenzene 98-82-8 $\overline{10}$ U 1,1,2,2-Tetrachloroethane $\overline{10}$ U 79-34-5 541-73-1 1,3-Dichlorobenzene 10 106-46-7 1,4-Dichlorobenzene 10 1,2-Dichlorobenzene 95-50-1 10 ŦĨ 1,2-Dibromo-3-Chloropropane 96-12-8

1,2,4-Trichlorobenzene

120-82-1

CaE11/7/02

FORM I VOA-2

-Lab Name: COMPUCHEM

1F

OLATILE	ORGANIC	S	ANALYSIS	DATA	SHEET
ΤΕΝΤΔΊ	T VIRVI	DEI	WTIFIED (COMPOI	MDS

GW09FBPB Contract: OLM04-REVS

EPA SAMPLE NO.

Lab	Code:	LIBRTY	Case No.:	SAS No.:	SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-10

Sample wt/vol: 5 ML(q/mL)Lab File ID: RW1067-10A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 Dilution Factor: 1.0 (mm)

Soil Aliquot Volume: ____(uL) _Soil Extract Volume:____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
		======	=========	====
$\frac{-1}{2}$				
2.				
4.				
4.				
6. 7. 8. 9.				
7.				
_ 8.				
10				
10. 11. -12. 13.				
$-\frac{1}{12}$.				
13.				
14. 15.				
15.				
<u>16.</u>				
17. 18.				
<u>18.</u> _19.				
$\frac{-19}{20}$				
21.			· · · · · · · · · · · · · · · · · · ·	
20. 21. 22. -23. 24. 25. 26.				
-23 .				
24.				
25.				
26.				
-27.				
28. 29. 30.				
29.				
_30.			<u></u>	

FORM I VOA-TIC

Lab Name: COMPUCHEM

Lab Code: LIBRTY

CAS NO.

COMPOUND

1A VOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

Contract: OLM04-REVS	GW10TBPB Trip Blank
SAS No.:	SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-11

Case No.: SAS No.:

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-11A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 Dilution Factor: 1.0 (mm)

Soil Aliquot Volume: ____(uL) Soil Extract Volume: (uL)

> CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L O

			(ug/ 2 02 ug/ lg/ o	<u> </u>
. —	75-71-8	Dichlorodifluoromethane	10	Ū
_	74-87-3	Chloromethane	10	U
T	75-01-4	Vinyl Chloride	10	Ū
-1-	74-83-9	Bromomethane	10	U
-	75-00-3	Chloroethane	10	U
_	75-69-4	Trichlorofluoromethane	10	Ū
1	75-35-4	1,1-Dichloroethene	10	U
1-	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
_	67-64-1	Acetone	10	U
Τ_	75-15-0	Carbon Disulfide	10	Ü
	79-20-9	Methyl Acetate	10	Ü
1 -	75-09-2	Methylene Chloride	10 3	JB U.T
_	156-60-5	trans-1,2-Dichloroethene	10	Ü
T_	1634-04-4	Methyl tert-Butyl Ether	10	U
	75-34-3	1,1-Dichloroethane	10	U
	156-59-2	cis-1,2-Dichloroethene	10	U
	78-93-3	2-Butanone	10	U
Τ_	67-66-3	Chloroform	10	U
<u>ا</u> _	71-55-6	1,1,1-Trichloroethane	10	U
	110-82-7	Cyclohexane	10	Ü
т_	56-23-5	Carbon Tetrachloride	10	U
	71-43-2	Benzene	10	Ü
1	107-06-2	1,2-Dichloroethane	10	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW10TBPB

- Lab Name: COMPUCHEM Contract: OLM04-REVS

SDG No.: RW1067

- Matrix: (soil/water) WATER

Lab Sample ID: RW1067-11

Sample wt/vol: 5 (g/mL) ML

Lab Code: LIBRTY Case No.: SAS No.:

Lab File ID: RW1067-11A73

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture: not dec.

Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm)

CAS NO.

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

COMPOUND

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

1-	79-01-6	Trichloroethene	10	U
_	108-87-2	Methylcyclohexane	10	U
_	78-87-5	1,2-Dichloropropane	10	U
1	75-27-4	Bromodichloromethane	10	U
'-	10061-01-5	cis-1,3-Dichloropropene	10	U
_	108-10-1	4-Methyl-2-Pentanone	10	U
\Box	108-88-3	Toluene	10 0.8	JB U
	10061-02-6	trans-1,3-Dichloropropene	10	U
	79-00-5	1,1,2-Trichloroethane	10	Ū
	127-18-4	Tetrachloroethene	10	Ū
	591-78-6	2-Hexanone	10	Ü
-	124-48-1	Dibromochloromethane	10	U
_	106-93-4	1,2-Dibromoethane	10	Ü
_	108-90-7	Chlorobenzene	10	U
	100-41-4	Ethylbenzene	10	Ū
	1330-20-7	Xylene (Total)	10	U
-	100-42-5	Styrene	10	U
_	75-25-2	Bromoform	10	U
	98-82-8	Isopropylbenzene	10	U
	79-34-5	1,1,2,2-Tetrachloroethane	10	Ū
-	541-73-1	1,3-Dichlorobenzene	10	Ū
	106-46-7	1,4-Dichlorobenzene	10	U
	95-50-1	1,2-Dichlorobenzene	10	U
-	96-12-8	1,2-Dibromo-3-Chloropropane	10	U
_	120-82-1	1,2,4-Trichlorobenzene	10	U
			00 6 1 1	

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FORM I VOA-2

Case No.:

Lab Code: LIBRTY

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

SAS No.:

SDG No.: RW1067

EPA SAMPLE NO.

				GW10TBPB
Lab Name: C	COMPUCHEM	Contract:	OLM04-REVS	

Lab Sample ID: RW1067-11 Matrix: (soil/water) WATER

Sample wt/vol: 5 Lab File ID: RW1067-11A73 (g/mL) ML

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. Date Analyzed: 09/26/02

ID: 0.32 GC Column: ZB-624 Dilution Factor: 1.0 (mm)

Soil Aliquot Volume: ____(uL) Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/L

T	 	1	 	
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	**************************************	=======	5	======
T_1.	LABORATORY ARTIFACT	15.29		JBK
2.				cae
3.				11/10
4.	<u> </u>			
T5				
6.				
7.				
8.				
9.				
10.				
11.				
T 12.				
13.				
14.				
15.				
T 16.				
17.				
18.				
				
20.				
21.				
21. 22. - 23.				
<u>- 23.</u>				
24.				
25.				
26.				
-27.				
28.				
29.				
30.				\
				

FORM I VOA-TIC

1A VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

_	Lab Name: COMPUCHEM ·	Contract: OLM04-REVS	SW-1
	Lab Code: LIBRTY Case No.:	SAS No.:	CAE 11/7/07 SDG No.: RU1067
_	Matrix: (soil/water) WATER	Lab Sample ID:	RU1067-1
	Sample wt/vol: 5 (g/mL) ML	Lab File ID: R	U1067-1A73
_	Level: (low/med) LOW	Date Received:	09/19/02
	% Moisture: not dec.	Date Analyzed:	09/25/02
_	GC Column: ZB-624 ID: 0.32 (mm)	Dilution Factor	: 1.0
	Soil Extract Volume: (ul.)	Soil Aliquet Vo	lume: (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

1_	75-71-8	Dichlorodifluoromethane	10	U
	74-87-3	Chloromethane	10	บ
	75-01-4	Vinyl Chloride	10	Ū
1	74-83-9	Bromomethane	10	Ū
1-	75-00-3	Chloroethane	10	Ū
	75-69-4	Trichlorofluoromethane	10	Ū
_	75-35-4	1,1-Dichloroethene	10	Ü
-	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	Ü
1-	67-64-1	Acetone	10	U
	75-15-0	Carbon Disulfide	10	U_
Τ.	79-20-9	Methyl Acetate	10	U
1	75-09-2	Methylene Chloride	10 -2	JB U.T
. –	156-60-5	trans-1,2-Dichloroethene	10	U
_	1634-04-4	Methyl tert-Butyl Ether	10	U
T	75-34-3	1,1-Dichloroethane	10	Ü
-	156-59-2	cis-1,2-Dichloroethene	10	U
_	78-93-3	2-Butanone	10	Ŭ _
	67-66-3	Chloroform	10	U_
1	71-55-6	1,1,1-Trichloroethane	10	U
1	110-82-7	Cyclohexane	10	U
_	56-23-5	Carbon Tetrachloride	10	U
_	71-43-2	Benzene	10	U
_	107-06-2	1,2-Dichloroethane	10	U

OE11/7/08

FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SDG No.: RU1067

					SW01PB
-	Lab Name:	COMPUCHEM	Contract:	OLM04-REVS	l

- Matrix: (soil/water) WATER Lab Sample ID: RU1067-1

Lab Code: LIBRTY Case No.: SAS No.:

96-12-8

120-82-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-1A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. ____ Date Analyzed: 09/25/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L O 79-01-6 Trichloroethene 10 108-87-2 Methylcyclohexane 78-87-5 1,2-Dichloropropane 10 75-27-4 Bromodichloromethane 10 Ū 10061-01-5 Ū cis-1,3-Dichloropropene 10 4-Methyl-2-Pentanone 108-10-1 10 u 108-88-3 Toluene 11) 0.5 trans-1,3-Dichloropropene 10061-02-6 1,1,2-Trichloroethane 10 Ū 79-00-5 127-18-4 Tetrachloroethene $\overline{10}$ $\overline{\mathbf{u}}$ 591-78-6 2-Hexanone 10 Ū Ū 10

124-48-1 Dibromochloromethane 1,2-Dibromoethane 106-93-4 10 Ū 108-90-7 Chlorobenzene 10 Ū 100-41-4 10 Ethylbenzene 1330-20-7 10 Ū Xylene (Total) Ū 100-42-5 Styrene 10 75-25-2 Bromoform 10 Ū 98-82-8 Isopropylbenzene 10 Ū 1,1,2,2-Tetrachloroethane 79-34-5 $\overline{10}$ Ū 541-73-1 1,3-Dichlorobenzene 10 106-46-7 1,4-Dichlorobenzene 10 95-50-1 10 IJ 1,2-Dichlorobenzene

1,2-Dibromo-3-Chloropropane

1,2,4-Trichlorobenzene

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FORM I VOA-2

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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA	SAMPLE	NO.

	IBMINITIVEDI IDE	BRITTIED COM COMP	SW01PB
Lab Name: COMPUCHEM	Cor	ntract: OLM04-REVS	

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-1A7

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-1A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. Date Analyzed: 09/25/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

Number TICs found: 2 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT)	EST. CONC.	Q
======================================	=======================================	======	==========	=====
_ 1.	LABORATORY ARTIFACT	14.32	6	JE
2.	LABORATORY ARTIFACT	15.29	6	JB 2
3.				046
4.				11/7/02
T 5.				1 110 t
6.				
7.				
8.				<u> </u>
T 9.	, ,, <u></u>			
10.				
11.				
12.				
13.				
14.				
15.	· · · · · · · · · · · · · · · · · · ·			
- 16.				
17.				
18.				
19.				<u> </u>
Т 20.				
21.				
22.				
23.				
T 24.				
25.				
26.				
- 27.				
7 28.	<u></u>			
29.				
30.				

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01DPPB SW-1D Contract: OLM04-REVS Cae 11/7/02 SDG No.: RU1067 Lab Code: LIBRTY Case No.: SAS No.:

- Matrix: (soil/water) WATER Lab Sample ID: RU1067-2

Lab Name: COMPUCHEM

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-2RA73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L 10 75-71-8 Dichlorodifluoromethane 74-87-3 Chloromethane 10 Ū 75-01-4 Vinyl Chloride Ū 10 74-83-9 Bromomethane Ū 10 75-00-3 Chloroethane 10 Ū 75-69-4 Trichlorofluoromethane 10 U 75-35-4 1,1-Dichloroethene 10 Ū 76-13-1 1,1,2-Trichloro-1,2,2-trifluoroethane Ū 10 67-64-1 Acetone 10 IJ Carbon Disulfide Methyl Acetate 75-15-0 0.9 79-20-9 10 ĪΪ 75-09-2 Methylene Chloride 156-60-5 trans-1,2-Dichloroethene 10 U 1634-04-4 Methyl tert-Butyl Ether 10 Ū 75-34-3 1,1-Dichloroethane Ū 10 cis-1,2-Dichloroethene 156-59-2 ΤÏ 10 78-93-3 11 2-Butanone 10 ĪΪ 67-66-3 Chloroform 10 1,1,1-Trichloroethane Ū 10 71-55-6 Ū 110-82-7 Cyclohexane 10 Ū 56-23-5 Carbon Tetrachloride 10 71-43-2 Ū Benzene 107-06-2 1,2-Dichloroethane

CAE 11/7/02

FORM I VOA-1

1B VOLATILE ORGANICS ANALYSIS DATA SHEET

SAS No.:

EPA SAMPLE NO.

SW01DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

SDG No.: RU1067

- Matrix: (soil/water) WATER

Lab Code: LIBRTY Case No.:

Lab Sample ID: RU1067-2

Sample wt/vol: 5 (g/mL) ML

Lab File ID: RU1067-2RA73

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture: not dec.

Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm)

CAS NO.

98-82-8

79-34-5

541-73-1

106-46-7

95-50-1

96-12-8

120-82-1

Dilution Factor: 1.0

Soil Extract Volume: (uL)

COMPOUND

Isopropylbenzene

1,4-Dichlorobenzene

1,2-Dichlorobenzene

1,2,4-Trichlorobenzene

1,1,2,2-Tetrachloroethane 1,3-Dichlorobenzene

1,2-Dibromo-3-Chloropropane

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

79-01-6 Trichloroethene 10 108-87-2 Methylcyclohexane Ū 78-87-5 1,2-Dichloropropane 10 Ū 10 75-27-4 Bromodichloromethane Ū 10061-01-5 cis-1,3-Dichloropropene 10 Ū 108-10-1 4-Methyl-2-Pentanone 10 Ū JB-11 108-88-3 Toluene 10 0.5 trans-1,3-Dichloropropene 1,1,2-Trichloroethane 10061-02-6 10 IJ 79-00-5 Ū 127-18-4 Tetrachloroethene 10 U 591-78-6 2-Hexanone 10 11 Dibromochloromethane 124-48-1 10 Ħ 1,2-Dibromoethane 106-93-4 10 Ū 108-90-7 Ū Chlorobenzene 10 100-41-4 Ū Ethylbenzene 10 Xylene (Total) 1330-20-7 10 Ū 100-42-5 10 Ū Styrene 10 75-25-2 Bromoform Ū

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FORM I VOA-2

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VOLATILE	ORGANICS	ANALYSIS	DATA	SHEET
TENTA	CIVELY ID	ENTIFIED (COMPO	INDS

	SW01DPPB

EPA SAMPLE NO.

Lab Name: COMPUC	HEM

Contract: OLM04-REVS

SW01DPPB	l
	ı

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RU1067

Matrix: (soil/water) WATER

Lab Sample ID: RU1067-2

Sample wt/vol: 5

(g/mL) ML Lab File ID: RU1067-2RA73

Level: (low/med)

LOW

Date Received: 09/19/02

% Moisture: not dec.

Date Analyzed: 09/26/02

GC Column: ZB-624

ID: 0.32 (mm) Dilution Factor: 1.0

Soil Aliquot Volume: ___ (uL)

Soil Extract Volume:____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
_ 1.	LABORATORY ARTIFACT	15.29	5	JB 2
2.				108
3.				
4.				11/3/00
T				
6.				
7.				
8.				I
T9.				
10.				
12.				
T 13.				
14.			- 	
15.				
T 16.				
17.				
18.				
19.				
T 20.				
21.				
22.				
23.				
24.				
25.				
26.				
28.				
29.				
30.				

FORM I VOA-TIC

1A VOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

SW04TBPB Contract: OLM04-REVS Trio Blank SDG No.: RU1067 SAS No.:

Lab Code: LIBRTY Case No.:

Matrix: (soil/water) WATER

Lab Sample ID: RU1067-6

Sample wt/vol:

- Lab Name: COMPUCHEM

(g/mL) ML 5

Lab File ID: RU1067-6A73

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture: not dec.

Date Analyzed: 09/25/02

GC Column: ZB-624 ID: 0.32 (mm)

CAS NO.

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: ____(uL)

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

1_	75-71-8	Dichlorodifluoromethane	10	U
	74-87-3	Chloromethane	10	U
┰¯	75-01-4	Vinyl Chloride	10	Ū
-	74-83-9	Bromomethane	10	Ū
1 -	75-00-3	Chloroethane	10	Ū
_	75-69-4	Trichlorofluoromethane	10	U
Τ_	75-35-4	1,1-Dichloroethene	10	Ū
1-	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
	67-64-1	Acetone	6	J
_	75-15-0	Carbon Disulfide	10	Ŭ
T	79-20-9	Methyl Acetate	10	Ū
-	75-09-2	Methylene Chloride	10 -2	JB UJ
_	156-60-5	trans-1,2-Dichloroethene	10	Ū
	1634-04-4	Methyl tert-Butyl Ether	10	Ü
-1-	75-34-3	1,1-Dichloroethane	10	Ū
1-	156-59-2	cis-1,2-Dichloroethene	10	Ū
_	78-93-3	2-Butanone	10	Ū
┰¯	67-66-3	Chloroform	10	Ū
1-	71-55-6	1,1,1-Trichloroethane	10	Ū
. –	110-82-7	Cyclohexane	10	Ū
_	56-23-5	Carbon Tetrachloride	10	Ū
т_	71-43-2	Benzene	10	U
-	107-06-2	1,2-Dichloroethane	10	U

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FORM I VOA-1

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Contract: OLM04-REVS

SW04TBPB

- Lab Name: COMPUCHEM Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RU1067

- Matrix: (soil/water) WATER

Lab Sample ID: RU1067-6

Sample wt/vol:

5

(q/mL) ML

Lab File ID: RU1067-6A73

CAS NO.

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture: not dec.

Date Analyzed: 09/25/02

GC Column: ZB-624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: (uL)

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

_	0.14		(43/1 01 43/13/ 00	72 &
1-	79-01-6	Trichloroethene	10	U
-	108-87-2	Methylcyclohexane	10	Ū
_	78-87-5	1,2-Dichloropropane	10	Ü
]	75-27-4	Bromodichloromethane	10	Ū
1-	10061-01-5	cis-1,3-Dichloropropene	10	Ū
_	108-10-1	4-Methyl-2-Pentanone	10	Ū
_	108-88-3	Toluene	10 0.7	JB U
	10061-02-6	trans-1,3-Dichloropropene	10	Ū
, –	79-00-5	1,1,2-Trichloroethane	10	U
_	127-18-4	Tetrachloroethene	10	U
T.	591-78-6	2-Hexanone	10	υ
-	124-48-1	Dibromochloromethane	10	U
_	106-93-4	1,2-Dibromoethane	10	Ū
_	108-90-7	Chlorobenzene	10	U
	100-41-4	Ethylbenzene	10	U
1	1330-20-7	Xylene (Total)	10	Ū
_	100-42-5	Styrene	10	U
_	75-25-2	Bromoform	10	U
	98-82-8	Isopropylbenzene	10	U
'-	79-34-5	1,1,2,2-Tetrachloroethane	10	U
	541-73-1	1,3-Dichlorobenzene	10	Ü
T_	106-46-7	1,4-Dichlorobenzene	10	U
	95-50-1	1,2-Dichlorobenzene	10	U
	96-12-8	1,2-Dibromo-3-Chloropropane	10	U
_	120-82-1	1,2,4-Trichlorobenzene	10	U
			44.5	

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FORM I VOA-2

1 F

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SW04TBPB

- Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RU1067

Matrix: (soil/water) WATER

Lab Sample ID: RU1067-6

Sample wt/vol: 5

(q/mL) ML

Lab File ID: RU1067-6A73

Level: (low/med)

ow/med) LOW

Date Received: 09/19/02

% Moisture: not dec.

Date Analyzed: 09/25/02

GC Column: ZB-624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume:_____(uL)

Number TICs found: 0

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q =====
_ 1.				
2.				
3.				
4.				
- 5.				
6.				
7.				
8.				
9.				
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_12.				
13. 14.				
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FORM I VOA-TIC

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DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

ORGANIC ANALYSIS DATA Semivolatiles in Water

SDG Nos. RU1067 and RW1067 September 2002 Sample Collections

Chemical Analyses Performed by: CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

November 12, 2002



EXECUTIVE SUMMARY

Validation of the semivolatile organics analysis data prepared by CompuChem Environmental for 14 water samples and one field blank from the Marion Bragg Landfill site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in two data packages under Sample Delivery Group (SDG) Nos. RU1067 and RW1067, which were received for review on October 4, 2002, with additional documentation provided on November 11, 2002. The following samples were reported:

SDG No. RW1067:

GW08PB (MB-1)

GW08DPPB (MB-1D)

GW07PB (MB-2)

GW03PB (MB-5)

GW04PB (MB-6)

GW05PB (MB-7)

GW06PB (MB-8) GW09FBPB (Field Blank) GW02PB (MB-9)

GW01PB (MB-10)

SDG No. RU1067:

PW01PB (PW-1)

SW01PB (SW-1)

SW01DPPB (SW-1D)

SW02PB (SW-5)

SW03PB (SW-6)

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for bis(2-ethylhexyl)phthalate in GW08PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the sample-specific contract required quantitation limit.
- Results for the three alkanes (RTs 19.5, 20.3, and 21.1 minutes) reported in GW08PB were rejected (R).
- To maintain consistency with historical project data, sample-specific CRQLs for all samples were adjusted by the validator as listed in Section XI.
- The peak identified as 1,1,2,2-tetrachloroethane (RT 5.01 minutes) in PW01PB was rejected (R).
- The complete compound name for the peak at RT 14.48 minutes [4,4'-(1-methylethylidene) bis phenol] in GW04PB was added to the Form I-TIC for this sample.
- The complete compound names for the peak at RT 13.21 minutes [2,4-dichloro-1-(trichloromethyl) benzene] and the peak at RT 13.53 minutes [1,4,5,6,7,7-



hexachloro-bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid] in GW06PB were added to the Form I-TIC for this sample.

• The tentative identification reported by the laboratory for the peak at RT 8.74 minutes in GW07PB was changed to "tert butyl phenol isomer" (from p-tert butyl phenol) by the validator and the "N" qualifier was removed.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XV). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XIV.

This validation report should be considered <u>part of both data packages</u> for all future distributions of the semivolatiles data.



INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Organics Analyses OLM04.2. Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used to denote specific information regarding the analytical results.

Validation was performed in conformance with the USEPA "Contract Laboratory Program National Functional Guidelines for Organic Data Review" (EPA 540/R-99/008, 10/99). The EPA Region II Standard Operating Procedure HW-6 (Rev 12), "Evaluation of Organics Data for the CLP," (3/01) was also considered during the evaluation and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with the National Functional Guidelines:

- U The material was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
- NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- UJ- The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.



R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified, and the results are therefore unusable.

These codes are recorded on the customized data tables contained in Attachment A and the Organic Analysis Data Sheets (Form Is) in Attachment B of this validation report to indicate qualifications placed on the data as a result of the review.

Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The samples were collected 9/17-18/02. Sample extractions were performed on 9/20/02, which is within the established (seven days from collection) holding time for all samples. Analyses were performed 9/23-24/02, well within the required holding time of 40 days from extraction. Therefore, both required holding times were met.

Acceptable (4°C ±2°C) cooler temperatures (4-6°C) on receipt at the laboratory were recorded on both COC records applicable to these samples. The same temperatures were also recorded on the laboratory's receiving logs in both data packages.

Sampler notations on each COC indicate that the samples for semivolatiles analysis were iced. The narrative in each data package further states that all samples were received intact and properly refrigerated.

II. GC/MS Instrument Performance Checks

Three decafluorotriphenylphosphine (DFTPP) instrument performance checks were run, representing every shift (12-hour period) during which samples or associated standards were analyzed. Results for all three instrument performance checks were acceptable.

III. Calibration

Analyses were performed on a single gas chromatograph/mass spectrometer (GC/MS) system identified as 5972HP66 (HP66). One or more target analytes required manual integration by the analyst in all of the standards associated with these samples. Documentation of each integration performed by the laboratory was provided in the data package; all manual integrations were correctly performed and accurately transcribed to the applicable quantitation report. Internal standard compound acenaphthene-d₁₀ was manually integrated in two initial calibration standards, internal standard compound chrysene-d₁₂ was manually integrated in one initial calibration standard, surrogate compound 2-chlorophenol-d₄ was manually integrated in one continuing calibration standard, surrogate compound phenol-d₅ was manually integrated in one continuing calibration standard and most of the samples, and surrogate compound 1,2-dichlorobenzene-d₄ was manually integrated in three initial calibration standards and all of the samples. These integrations were all fully documented and verified to be acceptable.

A. Initial Calibration (IC)

One IC (9/11-12/02 on HP66) was performed in support of the reported sample analyses. Documentation of all individual IC standards analyzed was present in both data packages and average relative response factor (RRF) as well as percent relative standard deviation (%RSD) values



were correctly calculated and accurately reported. All average RRFs were above the minimum response criterion (0.05) and all %RSDs were below the maximum acceptance criterion of 30%.

B. Continuing Calibration (CC)

Sample analyses were performed under two CC standards. Documentation of both CC standards was present in the applicable data package(s) and RRF as well as percent difference (%D) values were correctly calculated and accurately reported in all cases.

All RRFs were above the 0.05 minimum criterion in both of the CC standards. The following %D values were above the maximum acceptance criterion (25%):

9/23/02-14:13:

1,1'-biphenyl - 33.6%

4,6-dinitro-2-methylphenol - 32.5%

pentachlorophenol - 34.7%

9/24/02-11:42:

dimethylphthalate - 28.1%

2,4-dinitrophenol - 49.8%

4,6-dinitro-2-methylphenol - 34.9%

terphenyl-d₁₄ (SS) - 26.0%

No positive results were reported for the target analytes listed above in the samples associated with the affected CCs, the RRFs were all acceptable (i.e., were greater than 0.05) in the affected CC standards, and the %Ds were not substantially above the acceptance criterion (i.e., were not greater than 50%). In addition, no recovery problems were observed for the terphenyl-d₁₄ surrogate in the associated sample analyses. Therefore, no qualifiers were applied based on the CC standard results.

IV. Blanks

One laboratory method blank (MB: SBLKGQ) was prepared and analyzed with the samples in this data set. No target analytes or tentatively identified compounds were detected in the MB.

One field blank (GW09FBPB) was submitted with the "GW" samples in this data set. Bis(2-ethylhexyl)phthalate (0.6 μ g/L) was detected in the field blank. Results for bis(2-ethylhexyl)phthalate in GW08PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the sample-specific contract required quantitation limit (CRQL) because the reported values were less than ten times the concentration found in the associated field blank. No TICs were detected in GW09FBPB.



V. Surrogate Recoveries

Recoveries of the eight surrogate compounds in all site samples, spiked samples, and blanks were within the acceptance limits documented on the summary forms except for 2-fluorobiphenyl in GW03PB (126%; QC 43-116%) and GW09FBPB (123%), for terphenyl-d₁₄ in GW06PB (23%; QC 33-141%), and for nitrobenzene-d₅ in SBLKGQ (116%; QC 35-114%). Since only one surrogate was outside the acceptance limits in each sample, no sample results were qualified on this basis.

Not all of the laboratory-reported surrogate recoveries could be reproduced by the validator. In numerous cases, the validator-calculated recovery was 1-2% higher or lower than the laboratory-reported value. In no case did the difference affect whether a surrogate recovery was within or outside the acceptance limits. Therefore, no action was taken on this basis.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Sample SW01PB was prepared and analyzed as an MS/MSD pair. Percent recoveries and relative percent differences (RPDs) between paired recoveries were correctly calculated, accurately reported, and within the acceptance limits documented on Form 3 except for the recoveries of 4-chloro-3-methylphenol (118% and 125%; QC 23-97%) and 4-nitrophenol (89% and 92%; QC 10-80%) in both spiked analyses. These high recoveries suggest the possibility of reporting false positives or detected results that are biased high. Since neither analyte was detected in the unspiked sample, no action was taken on this basis.

No unspiked target analytes were detected in any of the three analyses of SW01PB. Therefore, no further quantitative evaluation of precision could be made using these data.

Although requested on the COC records, no semivolatile MS/MSD analyses were performed on sample GW08PB. According to the narrative, this was due to a laboratory scheduling error.

VII. Laboratory Control Sample

A laboratory control sample (SGQLCS) was analyzed in association with the samples in data set, and was reported in lieu of the MS/MSD analyses of GW08PB. Percent recoveries were within the analyte-specific acceptance limits documented on the summary form except for 4-chloro-3-methylphenol (127%; QC 23-97%). The high recovery suggests the possibility of reporting false positives or positive results that are biased high. Since 4-chloro-3-methylphenol was not detected in any of the samples in this data set, no action was warranted on this basis.



VIII. Field Duplicates

Sample GW08DPPB was identified as a field duplicate of GW08PB. After qualifications based on associated field blank contamination, no target analytes were reported in either sample Therefore, no quantitative evaluation of precision could be made using these data.

No TICs were reported in GW08DPPB, but a TIC at 5.4 minutes was reported as an unknown at an estimated concentration of 3 µg/L in GW08PB. However, a small peak at the same RT was visible in the chromatogram for GW08DPPB; therefore, no action was taken based on this apparent discrepancy. Three alkanes (RTs 19.5, 20.3, and 21.1 minutes) were also reported in GW08PB, but no evidence of any alkanes was present in the chromatogram for GW08DPPB. Due to lack of confirmation in the field duplicate analyses, the results for all three alkane TICs in GW08PB were rejected (R).

Sample SW01DPPB was identified as a field duplicate of SW01PB. No target compounds or TICs were detected in either of these samples. Therefore, no quantitative evaluation of precision could be made using these data.

IX. Internal Standard (IS) Performance

All IS areas and RTs were within the acceptance limits (>50% and <200% of the area responses in the associated CC standard and within ±30 seconds, respectively) in all reported sample analyses.

X. Target Compound Identification

All reported target analytes were correctly identified with acceptable supporting mass spectra present in the applicable data packages.

XI. Compound Quantitation and Reported Detection Limits

Target compound concentrations were correctly calculated and accurately reported for all reported sample analyses, including adjustments for the extraction of slightly more than 1000 mL of all samples.

Adjustments were not made by the laboratory to the CRQLs to reflect the concentration factors applicable when more than 1000 mL of the sample was extracted. Although lowering the CRQLs under these circumstances is not required by the SOW and reporting the routine CRQLs is not technically incorrect, this adjustment has been made by the laboratory on previous data sets



generated for this project. Therefore, to maintain consistency with historical project data, CRQLs for the following samples were adjusted by the validator to reflect extraction of slightly larger sample volumes than specified by the SOW:

Sample ID	Laboratory- Reported CRQLs	Volume Extracted/ Concentration Factor	Validator- Adjusted CRQLs
GW08PB	10/25 μg/L	1100 mL	9/23 μg/L
GW08DPPB	10/25 μg/L	1075 mL	9/23 μg/L
GW07PB	10/25 μg/L	1100 mL	9/23 μg/L
GW03PB	10/25 μg/L	1075 mL	9/23 μg/L
GW04PB	10/25 μg/L	1050 mL	10/24 μg/L
GW05PB	10/25 μg/L	1050 mL	10/24 μg/L
GW06PB	10/25 μg/L	1075 mL	9/23 μg/L
GW02PB	10/25 μg/L	1075 mL	9/23 μg/L
GW01PB	10/25 μg/L	1100 mL	9/23 μg/L
GW09FBPB	10/25 μg/L	1125 mL	9/22 μg/L
PW01PB	10/25 μg/L	1100 mL	9/23 μg/L
SW01PB	10/25 μg/L	1050 mL	10/24 μg/L
SW01DPPB	10/25 μg/L	1125 mL	9/22 μg/L
SW02PB	10/25 μg/L	1100 mL	9/23 μg/L
SW03PB	10/25 μg/L	1100 mL	9/23 μg/L

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation. Sample-specific CRQLs may be found on the laboratory-generated Form I for each sample (Attachment B) and on the data tables.

XII. Tentatively Identified Compounds (TIC)

One to 30 TICs were reported in nine of the site samples in this data set; no TICs were found in the remaining samples.



The peak identified as 1,1,2,2-tetrachloroethane (RT 5.01 minutes) in PW01PB was rejected (R) by the validator because this is a volatile organics target analyte and, when present, should be reported from that analysis fraction. In the semivolatiles analysis, it may be an artifact reflecting dimerization of methylene chloride in the injection port.

The complete compound name for the peak at RT 14.48 minutes [4,4'-(1-methylethylidene) bis phenol] in GW04PB was added to the Form I-TIC for this sample by the validator.

The complete compound names for the peak at RT 13.21 minutes [2,4-dichloro-1-(trichloromethyl) benzene] and the peak at RT 13.53 minutes [1,4,5,6,7,7-hexachloro-bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid] in GW06PB were added to the Form I-TIC for this sample by the validator.

The tentative identification reported by the laboratory for the peak at RT 8.74 minutes in GW07PB was changed to "tert butyl phenol isomer" (from p-tert butyl phenol) by the validator, and the "N" qualifier applied by the laboratory was removed. It is not possible to distinguish between structural isomers without the use of calibration standards to establish retention times.

All reported TICs were appropriately qualified as "J" by the laboratory to emphasize that these are *estimated* concentrations. Those TICs that were appropriately identified as a specific compound based on the library search were also qualified as "N" to emphasize that these are *tentative* identifications. These "J" and "N" qualifiers were not removed by the validator.

The Form I-TIC for each sample, as reported by the laboratory and with qualifiers and corrections noted as described above, are included in Attachment B to this report.

XIII. System Performance

The analytical system appears to have been working within method specifications at the time of these analyses, based on evaluation of the available raw data.

XIV. Documentation

The samples reported in SDG Nos. RU1067 and RW1067 were recorded on two chain of custody (COC) records, both of which were included in both data packages. The following issues were noted:

• Sample PW01PB was not recorded by the sampler on either of the COCs. An appropriate notation to this effect was made by the laboratory on COC #061476.



- Copies of courier airbills were not included in either data package to document the shipment portion of the sample transfers. Airbill numbers, however, were documented on both of the COC records.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

Library searches for 10 of the 30 reported TIC peaks in GW06PB (SDG No. RW1067) were not included in the data package received for review. On request, the laboratory provided the missing documentation via UPS on 11/11/02. These pages were inserted into the data package as pages 218A to 218J by the validator.

These documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XV. Overall Assessment

Sample results were determined to be valid as reported with the following exceptions:

- Results for bis(2-ethylhexyl)phthalate in GW08PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the sample-specific CRQL based on contamination in the associated field blank.
- Results for the three alkanes (RTs 19.5, 20.3, and 21.1 minutes) reported in GW08PB were rejected (R) due to lack of confirmation in the field duplicate analyses.
- To maintain consistency with historical project data, sample-specific CRQLs for all samples were adjusted by the validator as listed in Section XI to reflect the effective concentration factors applicable because more than 1000 mL of each sample was extracted.
- The peak identified as 1,1,2,2-tetrachloroethane (RT 5.01 minutes) in PW01PB was rejected (R) by the validator because this is a volatile organics target analyte and, when present, it should be reported from that analysis fraction.



- The complete compound name for the peak at RT 14.48 minutes [4,4'-(1-methylethylidene) bis phenol] in GW04PB was added to the Form I-TIC for this sample by the validator.
- The complete compound names for the peak at RT 13.21 minutes [2,4-dichloro-1-(trichloromethyl) benzene] and the peak at RT 13.53 minutes [1,4,5,6,7,7-hexachloro-bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid] in GW06PB were added to the Form I-TIC for this sample by the validator.
- The tentative identification reported by the laboratory for the peak at RT 8.74 minutes in GW07PB was changed to "tert butyl phenol isomer" (from p-tert butyl phenol) by the validator and the "N" qualifier was removed. It is not possible to distinguish between structural isomers without the use of calibration standards to establish retention times.

Documentation issues are discussed in Section XIII.

This validation report should be considered <u>part of both data packages</u> for all future distributions of the semivolatiles data.



ATTACHMENT A

DATA TABLES
SDG Nos. RU1067 and RW1067
Semivolatiles in Water
Marion Bragg Landfill - September 2002

Collection Point Sample ID ab Sample No. Collection Date.		MB-1 GW08PB RW1067-8 9/18/02	MB-1D GW08DPPB RW1067-9 9/18/02	MB-2 GW07PB RW1067-7 9/18/02	MB-5 GW03PB RW1067-3 9/18/02	MB-6 GW04PB RW1067-4 9/18/02	MB-7 GW05PB RW1067-5 9/18/02	MB-8 GW06PB RW1067-6 9/18/02	MB-9 GW02PI RW1067- 9/18/02
Concentration Factor ===>	CRQL	0.91	0.93	0.91	0.93	0.95	0.95	0.93	0.93
enzaldehyde	• 10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
henol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
is(2-Chloroethyl)ether	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
-Chlorophenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
-Methylphenol	10 10	9 U 9 U	9 U 9 U	9 U 9 U	9 U 9 U	10 U 10 U	10 U 10 U	9 U 9 U	9
,2'-oxybis(1-Chloropropane) acetophenone	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
-Methylphenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	ģ
l-Nitroso-di-n-propylamine	10	9 Ŭ	9 U	9 Ŭ	9 U	10 U	10 U	9 Ŭ	ģ
lexachloroethane	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
litrobenzene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
sophorone	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
-Nitrophenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
,4-Dimethylphenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
is(2-Chloroethoxy)methane	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
,4-Dichlorophenol	10	9 U	9 U 9 U	9 U	9 U 9 U	10 U 10 U	10 U 10 U	9 U 9 U	9
laphthalene -Chloroaniline	10 10	9 U 9 U	9 U	9 U 9 U	9 U	10 U	10 U	9 U	9
Cniorpaniine lexachlorobutadiene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
aprolactam	10	9 U	9 U	9 U	3 J	10 U	10 U	9 U	9
-Chloro-3-methylphenol	10	9 Ŭ	9 U	9 Ŭ	9 U	10 Ŭ	10 U	9 U	9
-Methylnaphthalene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
lexachlorocyclopentadiene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
4,6-Trichlorophenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
,4,5-Trichlorophenol	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23
,1'-Biphenyt	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
-Chloronaphthalene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
-Nitroaniline	25 10	23 U 9 U	23 U 9 U	23 U 9 U	23 U 9 U	24 U 10 U	24 U 10 U	23 U 9 U	23 9
imethylphthalate ,6-Dinitrotoluene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
cenaphthylene	10	9 U	9 U	9 Ŭ	9 Ŭ	10 U	10 U	ýΰ	ģ
-Nitronniline	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23
cenaphthene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
4-Dinitrophenol	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23
-Nitrophenol	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23
ribenzofuran	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
4-Dinitrotoluene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
ethylphthalate	10	9 U	9 U	0.2 J	9 U	10 U	10 U	9 U	9
Character de la later	10	9 U 9 U	9 U	9 U 9 U	9 U 9 U	10 U 10 U	10 U 10 U	9 U 9 U	9
-Chlorophenyl-phenylether -Nitroaniline	10 25	23 U	9 U 23 U	23 U	23 U	24 U	24 U	23 U	23
6-Dinitro-2-methylphenol	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23
-nitrosodiphenylamine	10	9 U	9 U	9 U	9 U	10 U	10 U	9 Ü	9
-Bromophenyl-phenylether	10	9 U	9 U	9 U	9 Ü	10 U	10 U	9Ū	9
iexachlorobenzene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
trazine	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
entachlorophenol	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23
henanthrene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
nthracene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
arbezole i n basidaktheleto	10	9 U 9 U	9 U 9 U	9 U 9 U	9 U 9 U	10 U 10 U	10 U 10 U	9 U 0.2 J	9
ri-n-butylphthalate luoranthene	10 10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
yrené	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
utylbenzylphthalate	10	ý Ŭ	9 U	9 0	9 Ü	10 U	10 U	9 Ŭ	ģ
3'-Dichlorobenzidine	10	9 Ŭ	9 Ŭ	9 U	9 U	10 U	10 U	9 U	9
enzo(a)anthracene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
hrysene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
is(2-Ethylhexyl)phthalate	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
i-n-octylphthalate	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
enzo(b)fluoranthene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
enzo(k)fluoranthene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
enzo(a)pyrene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9
ideno(1,2,3-cd)pyrene	10	9 U 9 U	9 U 9 U	9 U 9 U	9 U 9 U	10 U 10 U	10 U 10 U	9 U 9 U	9
vibenzo(a,h)anthracene	10	9 U	9 U	9 U	yυ	10 U	10 0	yυ	y

	Results are in ug/L Collection Point	 >	MB-10	Field Blank	PW-I	SW-1	SW-1D	SW-5	SW-6
	ounipro 10	~= >	GW01PB	GW09FBPB	PW01PB	SW01PB	SW01DPPB	SW02PB	SW03PB
	Lab Sample No.	 >	RW1067-1	RW1067-10	RU1067-5	RU1067-1	RU1067-2	RU1067-3	RU1067-4
	Collection Date.	 >	9/18/02	9/18/02	9/17/02	9/17/02	9/17/02	9/17/02	9/17/02
_	Concentration Factor>	CROL	0.91	0.89	0.91	0.95	0.89	0.91	0.91
	Benzaldehyde	ICKOL 10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Phenol	10	9 U	9 U	9 Ŭ	Ü Ü	9 U	9 0	9 0
	bis(2-Chloroethyl)ether	10	9 Ü	9 Ū	9 U	10 U	9 Ü	9 Ü	9 U
_	2-Chlorophenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	2-Methylphenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	2,2'-oxybis(1-Chloropropane)	10	9 U	9 U	9 U	10 U	U 6	9 U	9 U
	Acetophenone	.10	9 U	9 Ü	9 U	10 U	9 U	9 U	9 U
_	4-Methylphenol	10	9 U	9 U 9 U	9 U 9 U	10 U 10 U	9 U 9 U	9 U 9 U	9 U 9 U
	N-Nitroso-di-n-propylamine Hexachloroethane	10 10	9 U 9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Nitrobenzene	10	9 0	9 U	9 U	10 U	9 U	9 U	9 U
	Isophorone	10	9 U	9 U	9 Ŭ	10 U	9 U	9 U	9 0
_	2-Nitrophenol	10	9 Ŭ	9 U	9 U	10 U	9 Ü	9 Ŭ	9 Ŭ
	2,4-Dimethylphenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	bis(2-Chloroethoxy)methane	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	2,4-Dichlorophenol	10	9 U	9 U	9 U	TO O	9 U	9 U	9 U
_	Naphthalene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	4-Chlorogniline	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Hexachlorobutadiene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Caprolactam 4-Chloro-3-methylphenol	10 10	9 U 9 U	9 U 9 U	9 U 9 U	10 U 10 U	9 U 9 U	9 U 9 U	9 U 9 U
	2-Methylnaphthalene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Hexachlorocyclopentadiene	10	υè	9 Ŭ	9 U	10 Ŭ	9 U	ŷΰ	9 Ŭ
	2,4,6-Trichlorophenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	2,4,5-Trichlorophenol	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
	1,1'-Bipbenyt	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
_	2-Chloronaphthalene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	2-Nitroaniline	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
	Dimethylphthalate	10	9 ប 9 ប	9 ប 9 ប	9 U 9 U	10 A 10 A	9 U 9 U	9 ប 9 ប	9 U 9 U
	2,6-Dinitrotoluene Acenaphthylene	10 10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	3-Nitroaniline	25	23 U	22 [⊤] U	23 U	24 U	22 U	23 U	23 U
	Acenaphthene	10	9 U	9 U	9.0	10 U	9 Ŭ	9 U	9 U
	2,4-Dinitrophenol	25	23 U	22 U	23 U	24 U	22 U	23 U	2 3 U
	4-Nitrophenol	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
_	Dibenzofuran	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	2,4-Dinitrotoluene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Diethylphthalate Fluorene	10	9 U	9 U 9 U	9 U 9 U	10 U 10 U	9 U 9 U	9 U 9 U	9 U 9 U
	4-Chlorophenyl-phenylether	10 10	9 U 9 U	9 U	9 U	10 U	9 U	9 U	9 U
_	4-Nitrosniline	25	23 U	22 Ŭ	23 Ŭ	24 U	22 U	23 U	23 Ŭ
	4.6-Dinitro-2-methylphenol	25	23 Ŭ	22 U	23 U	24 Ü	22 U	23 U	23 Ū
	N-nitrosodiphenylamine	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	4-Bromophenyl-phenylether	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
_	Hexachlorobenzene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Atrazine	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Pentachlorophenol	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
	Phenanthrene Anthracene	10 10	9 U 9 U	9 U 9 U	9 U 9 U	U 01 U 01	บ e บ e	9 U 9 U	9 U 9 U
-	Carbazole	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Di-n-butylphthelate	10	9 U	9 U	9 Ŭ	10 U	9 Ŭ	9 U	9 Ü
	Fluoranthene	10	ýΰ	9 Ŭ	9 U	10 U	9 Ŭ	9 Ü	9 U
	Pyrene	10	9 U	9 U	9 U	10 U	9 Ū	9 Ū	9 U
_	Butylbenzylphthalate	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	3,3'-Dichlorobenzidine	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Benzo(a)anthracene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Chrysene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
_	bis(2-Ethylhexyl)phthalate	10	9 U	0.6 J	9 U	10 U	9 U	9 U	9 U
	Di-n-octylphthalate	10	9 U	9 U	9 U	10 U	9 U	9 U 9 U	9 U
	Benzo(b)fluoranthene Benzo(k)fluoranthene	10 10	9 U 9 U	9 U 9 U	9 U 9 U	10 U 10 U	9 U 9 U	9 U	9 U 9 U
	Benzo(a)pyrene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
_	Indeno(1,2,3-od)pyrene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
	Dibenzo(a,h)anthracene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U



ATTACHMENT B

ORGANIC ANALYSIS DATA SHEETS (Form Is)
SDG Nos. RU1067 and RW1067
Semivolatiles in Water
Marion Bragg Landfill - September 2002

EPA SAMPLE NO.

-Lab Name: COMPUCHEM Contract: OLM04-REVS GW08PB

Lab Code: LIBRTY

Case No.:

SAS No.:

Carullor SDG No.: RW1067

-Matrix: (soil/water) WATER

Lab Sample ID: RW1067-8

Sample wt/vol:

1100 (g/mL) ML Lab File ID: RW1067-8A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture:

decanted: (Y/N)____

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N)N pH: ____

Extraction:

(Type)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

				
_	100-52-7	Benzaldehyde	9 10	Ü
Γ=	108-95-2	Phenol	10	Ü
1	111-44-4	bis(2-Chloroethyl)ether	10	Ü
٠ _	95-57-8	2-Chlorophenol	10	Ü
	95-48-7	2-Methylphenol	10	Ū
Γ	108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
	98-86-2	Acetophenone	1-0	Ü
,	106-44-5	4-Methylphenol	10	Ü
	621-64-7	N-Nitroso-di-n-propylamine	10	Ü
Г	67-72-1	Hexachloroethane	1-10	Ū
	98-95-3	Nitrobenzene	10	Ū
• —	78-59-1	Isophorone	1.0	Ü
_	88-75-5	2-Nitrophenol	1.0	Ū
Γ	105-67-9	2,4-Dimethylphenol	10	Ū
	111-91-1	bis(2-Chloroethoxy)methane	10	Ū
_	120-83-2	2,4-Dichlorophenol	1-0	Ū
	91-20-3	Naphthalene	10	Ū
	106-47-8	4-Chloroaniline	1.0	Ū
	87-68-3	Hexachlorobutadiene	10	Ū
	105-60-2	Caprolactam	1.0	Ū
Τ	59-50-7	4-Chloro-3-methylphenol	10	Ū
	91-57-6	2-Methylnaphthalene	10	Ū
· —	77-47-4	Hexachlorocyclopentadiene	10	Ū
	88-06-2	2,4,6-Trichlorophenol	1 10	Ū
T-	95-95-4	2,4,5-Trichlorophenol	23- 25	Ū
	92-52-4	1,1'-Biphenyl	9 10	Ü
	91-58-7	2-Chloronaphthalene	110	Ü
	88-74-4	2-Nitroaniline	23 25	Ū
1-	131-11-3	Dimethylphthalate	9 10	Ü
1	606-20-2	2,6-Dinitrotoluene	910	Ü
_	208-96-8	Acenaphthylene	9.10	Ū
	99-09-2	3-Nitroaniline	23 25	Ū
	83-32-9	Acenaphthene	9 10	Ū
				I

FORM I SV-1

SAS No.:

EPA SAMPLE NO.

GW08PB

_ Lab Name: COMPUCHEM Contract: OLM04-REVS

SDG No.: RW1067

- Matrix: (soil/water) WATER

Lab Code: LIBRTY Case No.:

Lab Sample ID: RW1067-8

Sample wt/vol: 1100 (g/mL) ML

Lab File ID: RW1067-8A66

- Level: (low/med) LOW

Date Received: 09/19/02

% Moisture: ____ decanted: (Y/N)___

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: ____

Extraction: (Type) CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

	51-28-5	2,4-Dinitrophenol	23 25	U
	100-02-7	4-Nitrophenol	23 25	Ü
	132-64-9	Dibenzofuran	910	Ū
	121-14-2	2,4-Dinitrotoluene	10	Ū
	84-66-2	Diethylphthalate	1.0	U
	86-73-7	Fluorene	10	Ū
7	005-72-3	4-Chlorophenyl-phenylether	10	Ū
	100-01-6	4-Nitroaniline	23 25	Ū
	534-52-1	4,6-Dinitro-2-methylphenol	23 25	U
	86-30-6	N-nitrosodiphenylamine (1)	9 10	Ū
	101-55-3	4-Bromophenyl-phenylether	110	Ū
1	118-74-1	Hexachlorobenzene	110	Ū
1	912-24-9	Atrazine	↓ ±0	Ü
Τ	87-86-5	Pentachlorophenol	23 2 5	Ū
	85-01-8	Phenanthrene	9 10	Ü
·	120-12-7	Anthracene	, 10	Ū
	86-74-8	Carbazole	10	U
T	84-74-2	Di-n-butylphthalate	10	Ū
]	206-44-0	Fluoranthene	10	Ū
	129-00-0	Pyrene	10	U
	85-68-7	Butylbenzylphthalate	10	Ū
	91-94-1	3,3'-Dichlorobenzidine	10	Ū
	56-55-3	Benzo(a)anthracene	10	Ū
	218-01-9	Chrysene	10	Ū
	117-81-7	bis(2-Ethylhexyl)phthalate	_1	J 11
	117-84-0	Di-n-octylphthalate	10	
	205-99-2	Benzo(b) fluoranthene	10	-u -
	207-08-9	Benzo(k) fluoranthene	10	-ŭ -
Ţ 	50-32-8	Benzo (a) pyrene	1.0	Ū
	193-39-5	Indeno(1,2,3-cd)pyrene	1.0	Ū
 -	53-70-3	Dibenzo (a, h) anthracene	10	- U
	191-24-2	Benzo (g, h, i) perylene	↓ 10	Ü
i		nnot be separated from Diphenylamine	Casutson	1
			בסובוווו	/
		FORM I SV-2	,,,	OLM04.2
_				

Case No.:

Lab Code: LIBRTY

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

1G

TENTATIVELY IDENTIFIED COMPOUNDS

SAS No.:

			i	GW08PB
- Lab Name:	COMPUCHEM	Contract:	OLM04-REVS	

- Matrix: (soil/water) WATER Lab Sample ID: RW1067-8

Sample wt/vol: 1100 (g/mL) MLLab File ID: RW1067-8A66

Level: (low/med) LOW Date Received: 09/19/02

Decanted: (Y/N) Date Extracted:09/20/02 % Moisture:

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/24/02

Injection Volume: Dilution Factor: 1.0 2.0 (uL)

GPC Cleanup: (Y/N) Extraction: (Type) CONT N pH:

CONCENTRATION UNITS: Number TICs found: 1 (ug/L or ug/Kg) UG/L

T CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.40	3	==== J
2.				
т_3.				
4.				
5.	<u> </u>			
7 7.				
8.		+		
9.		1		
_ 10.				
11.				
12.				
13.				
T 14.				
16.				
17.		 		
7 18.				
19.				
20.				
21.				
22.				
24.				
7 25.		 		
26.		1		
27.				
28.				
29.				
30.				

FORM I SV-TIC

OLM04.2

EPA SAMPLE NO.

SDG No.: RW1067

ALKANE NARRATIVE REPORT Report date : 10/02/2002 SDG: RW1067

ient Sample ID: GW08PB Lab _mpound MB- CAEu blor	Sample ID: RW1067-8 RT Est.	File ID: Conc. Q	RW1067-8A66
'traight-Chain Alkane raight-Chain Alkane	19.47 20.33	2 J	"R R
ranched Alkane	21.09		R
		C	12Enlixor

EPA SAMPLE NO.

GW08DPPB

Contract: OLM04-REVS

M6-1D

CAE 11602

SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-9

Case No.:

- Lab Name: COMPUCHEM

Lab Code: LIBRTY

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-9A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: decanted: (Y/N) Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Extraction: (Type) CONT

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L (

0.10		(=5/ = == =5/ =5/ = <u>==</u>	-7_= ×
100-52-7	Benzaldehyde	9 10	U
108-95-2	Phenol	10	Ū
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	Ū
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	Ū
106-44-5	4-Methylphenol	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	Ū
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	Ü
78-59-1	Isophorone	10	Ū
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	10	Ū
111-91-1	bis(2-Chloroethoxy)methane	1-0	U
120-83-2	2,4-Dichlorophenol	1.0	Ū
91-20-3	Naphthalene	10	Ū
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	1.0	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	V 10	U
95-95-4	2,4,5-Trichlorophenol	23 2 5	U
92-52-4	1,1'-Biphenyl	9 10	U
91-58-7	2-Chloronaphthalene	9 10	Ü
88-74-4	2-Nitroaniline	23 2 5	Ū
131-11-3	Dimethylphthalate	910	U
606-20-2	2,6-Dinitrotoluene	110	Ū
208-96-8	Acenaphthylene	√ 10	U
99-09-2	3-Nitroaniline	a3 25	U
83-32-9	Acenaphthene	910	,U,
		CAEVIKSON "	11702
	EODM T CV 1	• • •	OT MOA

FORM I SV-1

EPA SAMPLE NO.

GW08DPPB

- Lab Name: COMPUCHEM Contract: OLM04-REVS

Case No.:

SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER

Lab Sample ID: RW1067-9

Sample wt/vol:

Lab Code: LIBRTY

1075 (g/mL) ML Lab File ID: RW1067-9A66

Level:

(low/med) LOW Date Received: 09/19/02

% Moisture:

decanted: (Y/N)

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH:____

Extraction: (Type)

CONT

CONCENTRATION UNITS:

CAS	NO.	COMPOUND

(ug/L or ug/Kg) UG/L

_			·			
	51-28-5	2,4-Dinitrophenol	23 25	U		
τ-	100-02-7	4-Nitrophenol	23 2 5	U		
-1-	132-64-9	Dibenzofuran	g 10	Ü		
1	121-14-2	2,4-Dinitrotoluene	10	Ū		
-	84-66-2	Diethylphthalate	1-0	Ū		
┌	86-73-7	Fluorene	10	U		
1-	7005-72-3	4-Chlorophenyl-phenylether	¥ 10	U		
. –	100-01-6	4-Nitroaniline	23 25	Ü		
	534-52-1	4,6-Dinitro-2-methylphenol	23 25	Ū		
Τ	86-30-6	N-nitrosodiphenylamine (1)	9 10	Ŭ		
-	101-55-3	4-Bromophenyl-phenylether	1 10	Ū		
	118-74-1	Hexachlorobenzene	1-0	Ū		
	1912-24-9	Atrazine	↓ 1 0	Ū		
1-	87-86-5	Pentachlorophenol	23 2 5	Ū		
1-	85-01-8	Phenanthrene	9 1 0	Ū		
_	120-12-7	Anthracene	; 10	Ū		
Τ-	86-74-8	Carbazole	(10)	Ū		
-1-	84-74-2	Di-n-butylphthalate	10	U		
, —	206-44-0	Fluoranthene	1.0	Ū		
_	129-00-0	Pyrene	10	Ü		
T	85-68-7	Butylbenzylphthalate	10	Ū		
-	91-94-1	3,3'-Dichlorobenzidine	1-0	Ū		
	56-55-3	Benzo (a) anthracene	10	U		
_	218-01-9	Chrysene	10	Ū		
-	117-81-7	bis(2-Ethylhexyl)phthalate	10	Ū		
	117-84-0	Di-n-octylphthalate	1.0	Ū		
_	205-99-2	Benzo(b) fluoranthene	10	Ū		
	207-08-9	Benzo(k)fluoranthene	10	U		
	50-32-8	Benzo(a)pyrene	10	Ū		
_	193-39-5	Indeno(1,2,3-cd)pyrene	10	Ū		
_	53-70-3	Dibenzo(a, h) anthracene	10	U		
	191-24-2	Benzo(g,h,i)perylene	V 10	U		
_	(1) - Cannot be separated from Diphenylamine					

(1) - Cannot be separated from Diphenylamine

Ca & 11/12/02

FORM I SV-2

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

GW08DPPB

EPA SAMPLE NO.

-Lab Name: COMPUCHEM

Number TICs found: 0

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-9

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-9A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: ____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Extraction: (Type) CONT

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

_ CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		======	2========	=====
2.				
- 3.				
4.				
5.				
6.				
7.				
9.				
10				
10. 11.				
12.				
13.				
12. 13. -14.				
15.				
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17. 18.				
18.			· · · · · · · · · · · · · · · · · · ·	
19. 20. 21. 22. 23. 24. 25.				
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FORM I SV-TIC

EPA SAMPLE NO.

Tab Name: COMPUCHEM

Contract: OLM04-REVS

MB-2

CAE || L| O2

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-7

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RW1067-7A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: ____ decanted: (Y/N) ___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Extraction: (Type) CONT

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

100-52-7	Benzaldehyde	9 10	Ü
T 108-95-2	Phenol	1-0	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
T 108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ü
98-86-2	Acetophenone	10	Ü
106-44-5	4-Methylphenol	1-0	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	Ū
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	1-0	Ū
111-91-1	bis(2-Chloroethoxy)methane	10	Ū
120-83-2	2,4-Dichlorophenol	1-0	Ū
T 91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
T 59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	Ū
88-06-2	2,4,6-Trichlorophenol	↓ 10	Ü
95-95-4	2,4,5-Trichlorophenol	23 2 5	Ū
92-52-4	1,1'-Biphenyl	9 10	Ū
91-58-7	2-Chloronaphthalene	9 10	Ū
88-74-4	2-Nitroaniline	23 25	Ū
131-11-3	Dimethylphthalate	9 10	Ū
606-20-2	2,6-Dinitrotoluene	110	Ū
208-96-8	Acenaphthylene	₹10	U
7 99-09-2	3-Nitroaniline	2325	Ū
83-32-9	Acenaphthene	9 10	U
· ————————————————————————————————————			·

FORM I SV-1

Ca Euik Son OLMO4.2

EPA SAMPLE NO.

GW07PB

- Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RW1067

- Matrix: (soil/water) WATER

Lab Sample ID: RW1067-7

Sample wt/vol:

1100

(q/mL) ML

1000 (uL)

Lab File ID: RW1067-7A66

Level:

(low/med)

Date Received: 09/19/02

LOW

Date Extracted: 09/20/02

% Moisture:

decanted: (Y/N) Concentrated Extract Volume:

2.0 (uL)

Date Analyzed: 09/24/02

Injection Volume:

Dilution Factor: 1.0

(Type) CONT

GPC Cleanup:

(Y/N) N pH: ____

Extraction:

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	51-28-5	2,4-Dinitrophenol	23 25	Ū
_	100-02-7	4-Nitrophenol	23 25	Ū
	132-64-9	Dibenzofuran	9 10	Ū
- 17	121-14-2	2,4-Dinitrotoluene	9 +0	U
	84-66-2	Diethylphthalate	0.2	J
Ŧ	86-73-7	Fluorene	9 10-	U
	7005-72-3	4-Chlorophenyl-phenylether	910	Ū
1-	100-01-6	4-Nitroaniline	2325	Ū
	534-52-1	4,6-Dinitro-2-methylphenol	23 2 5	Ū
T	86-30-6	N-nitrosodiphenylamine (1)	9 1 0	U
	101-55-3	4-Bromophenyl-phenylether	110	U
	118-74-1	Hexachlorobenzene	1.0	U
	1912-24-9	Atrazine	10	Ū
	87-86-5	Pentachlorophenol	್ರಿ 33 2 5	Ū
- 1	85-01-8	Phenanthrene	9 10	Ū
_	120-12-7	Anthracene	10	Ū
	86-74-8	Carbazole	10	Ū
- [84-74-2	Di-n-butylphthalate	10	Ū
' -	206-44-0	Fluoranthene	10	U
_	129-00-0	Pyrene	\ 10	U
T_	85-68-7	Butylbenzylphthalate	10	U
- []	91-94-1	3,3'-Dichlorobenzidine	10	U
	56-55-3	Benzo (a) anthracene	1:0	Ū
	218-01-9	Chrysene	10	U
T	117-81-7	bis(2-Ethylhexyl)phthalate	10	U
17	117-84-0	Di-n-octylphthalate	10	U
_	205-99-2	Benzo(b)fluoranthene	10	Ū
~ [~]	207-08-9	Benzo(k)fluoranthene	10	Ū
-	50-32-8	Benzo(a)pyrene	10	Ū
1-	193-39-5	Indeno(1,2,3-cd)pyrene	10	U
_	53-70-3	Dibenzo(a,h)anthracene	10	Ū
٦	191-24-2	Benzo(g,h,i)perylene	¥ 10	U
	(1) - Ca	annot be separated from Diphenylamine	Cas wold	·

caenlolor

FORM I SV-2

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

GW07PB	
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-	Lab	Name:	COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RW1067

- Matrix: (soil/water) WATER

Lab Sample ID: RW1067-7

Sample wt/vol: 1100 (g/mL) ML

Lab File ID: RW1067-7A66

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture: Decanted: (Y/N) Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 09/24/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: ____

Extraction: (Type) CONT

CONCENTRATION UNITS: (uq/L or ug/Kg) UG/L

Number TICs found: 5

CAS NUMBER COMPOUND NAME EST. CONC. RT_____ ============== UNKNOWN 5.40 2 J 5.80 UNKNOWN 3 3. -98-54-4 PHENOL, D-TERT-BUTYL- ISOMER 8.74 3 **M**J 9.45 UNKNOWN 3 J 5. UNKNOWN 14.18 11 J 6. COENIESON WINDOW 9._ 10. $\overline{12}$. **1**3. 14. <u> 15.</u> 16. 17. 18. 19. 20. 21. 23. 24. <u>25.</u> 26. 27. 28. 29. <u>30.</u>

FORM I SV-TIC

EPA SAMPLE NO.

-Lab Name: COMPUCHEM Contract: OLM04-REVS GW03PB

Lab Code: LIBRTY

Case No.:

LOW

SAS No.:

128 116 02 SDG No.: RW1067

-Matrix: (soil/water) WATER

Lab Sample ID: RW1067-3

Sample wt/vol:

1075 (g/mL) ML Lab File ID: RW1067-3A66

Level: (low/med)

Date Received: 09/19/02

% Moisture:

decanted: (Y/N)

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N)N pH: ____

Extraction:

(Type) CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	100 60 7	Dongoldohado	212	TT.
	100-52-7	Benzaldehyde	9 10	U
Γ=	108-95-2	Phenol	10	
	111-44-4	bis(2-Chloroethyl)ether	10	Ŭ
' <u>—</u>	95-57-8	2-Chlorophenol	10	U
	95-48-7	2-Methylphenol	10	U
Γ	108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
	98-86-2	Acetophenone	10	U
'	106-44-5	4-Methylphenol	10	Ü
_	621-64-7	N-Nitroso-di-n-propylamine	10	Ü
Τ	67-72-1	Hexachloroethane	10	U
	98-95-3	Nitrobenzene	10	U
	78-59-1	Isophorone	10	Ü
	88-75-5	2-Nitrophenol	10	U
	105-67-9	2,4-Dimethylphenol	10-	Ū
1	111-91-1	bis(2-Chloroethoxy)methane	10	Ū
	120-83-2	2,4-Dichlorophenol	10	Ū
	91-20-3	Naphthalene	1-0	Ū
	106-47-8	4-Chloroaniline	10	Ū
,	87-68-3	Hexachlorobutadiene	¥ 10	U
	105-60-2	Caprolactam	3	J
	59-50-7	4-Chloro-3-methylphenol	9 10	Ū
	91-57-6	2-Methylnaphthalene	10	U
'	77-47-4	Hexachlorocyclopentadiene	/ 10	Ū
	88-06-2	2,4,6-Trichlorophenol	↓ 10	U
	95-95-4	2,4,5-Trichlorophenol	23 25 9 10	Ū
	92-52-4	1,1'-Biphenyl	9 10	U
	91-58-7	2-Chloronaphthalene	9 10	U
	88-74-4	2-Nitroaniline	23 25	U
	131-11-3	Dimethylphthalate	9 10	Ū
1—	606-20-2	2,6-Dinitrotoluene	110	Ū
	208-96-8	Acenaphthylene	¥10	U
	99-09-2	3-Nitroaniline	23 25	<u> </u>
	83-32-9	Acenaphthene	9 10	-Ū
١			MGLIV Son	, '

FORM I SV-1

EPA SAMPLE NO.

SDG No.: RW1067

GW03PB Lab Name: COMPUCHEM Contract: OLM04-REVS Lab Code: LIBRTY

SAS No.:

- Matrix: (soil/water) WATER

Lab Sample ID: RW1067-3

Sample wt/vol:

1075 (g/mL) ML

Lab File ID: RW1067-3A66

- Level: (low/med) LOW

Date Received: 09/19/02

% Moisture: decanted: (Y/N)___

Case No.:

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: ____

Extraction: (Type) CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

. —	51-28-5	2,4-Dinitrophenol	23 25	U
_	100-02-7	4-Nitrophenol	23 25	- 0
┰~	132-64-9	Dibenzofuran	9 10	Ü
-	121-14-2	2,4-Dinitrotoluene	110	Ü
' –	84-66-2	Diethylphthalate	10	Ü
-	86-73-7	Fluorene	10	Ü
T	7005-72-3	4-Chlorophenyl-phenylether	¥ <u>10</u>	U
1-	100-01-6	4-Nitroaniline	23 25	Ū
_	534-52-1	4,6-Dinitro-2-methylphenol	23 25	Ū
Τ-	86-30-6	N-nitrosodiphenylamine (1)	9 10	Ū
-	101-55-3	4-Bromophenyl-phenylether	110	Ū
	118-74-1	Hexachlorobenzene	1.0	Ū
_	1912-24-9	Atrazine	₩10	Ü
T.	87-86-5	Pentachlorophenol	23 25	U
	85-01-8	Phenanthrene	9 10	_U_
	120-12-7	Anthracene	, 10	U
	86-74-8	Carbazole	10	U
Τ.	84-74-2	Di-n-butylphthalate	1-0	Ŭ
_	206-44-0	Fluoranthene	10	Ū
	129-00-0	Pyrene	10	U
Т	85-68-7	Butylbenzylphthalate	10	U
1_	91-94-1	3,3'-Dichlorobenzidine	10	U
'	56-55-3	Benzo(a)anthracene	10	U
_	218-01-9	Chrysene	₹ 10	U
Τ	117-81-7	bis(2-Ethylhexyl)phthalate	9 -1	<i>-</i> ₹ U
_	117-84-0	Di-n-octylphthalate	10	U
_	205-99-2	Benzo(b)fluoranthene	10	U
	207-08-9	Benzo(k)fluoranthene	10	Ū
_	50-32-8	Benzo(a)pyrene	10	U
_	193-39-5	Indeno(1,2,3-cd)pyrene	10	U
_	53-70-3	Dibenzo(a,h)anthracene	10	U
-	191-24-2	Benzo(g,h,i)perylene	₩ 10	U
	(1) - Ca	annot be separated from Diphenylamine	CRE 11/12/0	12

FORM I SV-2

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

_ Lab	Name:	COMPUCHE	M		Contract: OLM04-REVS		GWU3PB	
Lab	Code:	LIBRTY	Case	No.:	SAS No.:		SDG No.:	RW1067

- Matrix: (soil/water) WATER Lab Sample ID: RW1067-3

Sample wt/vol: 1075 (q/mL) MLLab File ID: RW1067-3A66

Level: (low/med) Date Received: 09/19/02 LOW

Decanted: (Y/N) % Moisture: Date Extracted: 09/20/02

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/24/02

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Extraction: (Type) CONT N pH:

CONCENTRATION UNITS: - Number TICs found: 4 (ug/L or ug/Kg) UG/L

CAS NUMBER COMPOUND NAME RT EST. CONC.	Q =====
	=====
	J
2. 134-62-3 DIETHYLTOLUAMIDE 10.90 71	
	J
	NJ
5.	
6.	
r 7.	
8.	
9.	
10.	
12.	
13.	
_ 14.	
15.	
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Т 18.	
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T 29.	
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FORM I SV-TIC

EPA SAMPLE NO.

GW04PB Contract: OLM04-REVS MB-6

Lab Code: LIBRTY SAS No.: Case No.:

Lab Name: COMPUCHEM

Caenlor SDG No.: RW1067

— Matrix: (soil/water) WATER Lab Sample ID: RW1067-4

Lab File ID: RW1067-4A66 Sample wt/vol: $1050 \quad (q/mL) \quad ML$

- Level: (low/med) Date Received: 09/19/02 LOW

Date Extracted: 09/20/02 % Moisture: decanted: (Y/N)___

Concentrated Extract Volume: Date Analyzed: 09/24/02 1000 (uL)

Dilution Factor: 1.0 Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N pH: Extraction: (Type) CONT

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

				
	100-52-7	Benzaldehyde	10	U_
	108-95-2	Phenol	10	Ū
T	111-44-4	bis(2-Chloroethyl)ether	10	Ū
1	95-57-8	2-Chlorophenol	10	Ü
	95-48-7	2-Methylphenol	10	Ū
	108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
1	98-86-2	Acetophenone	10	Ū
1	106-44-5	4-Methylphenol	10	U
	621-64-7	N-Nitroso-di-n-propylamine	10	Ü
τ	67-72-1	Hexachloroethane	10	Ū
	98-95-3	Nitrobenzene	10	Ū
1 —	78-59-1	Isophorone	10	U
	88-75-5	2-Nitrophenol	10	Ū
T	105-67-9	2,4-Dimethylphenol	10	U
	111-91-1	bis(2-Chloroethoxy)methane	10	Ū
· ——	120-83-2	2,4-Dichlorophenol	10	Ū
	91-20-3	Naphthalene	10	U
T	106-47-8	4-Chloroaniline	10	U
	87-68-3	Hexachlorobutadiene	10	Ū
	105-60-2	Caprolactam	10	U
	59-50-7	4-Chloro-3-methylphenol	10	U
1	91-57-6	2-Methylnaphthalene	10	U
ı ——	77-47-4	Hexachlorocyclopentadiene	10	U
	88-06-2	2,4,6-Trichlorophenol	10	U
т	95-95-4	2,4,5-Trichlorophenol	24 25	U
	92-52-4	1,1'-Biphenyl	10	U
· 	91-58-7	2-Chloronaphthalene	10	Ū
	88-74-4	2-Nitroaniline	24 25	U
T	131-11-3	Dimethylphthalate	10	Ū
-	606-20-2	2,6-Dinitrotoluene	10	U
	208-96-8	Acenaphthylene		U
_	99-09-2	3-Nitroaniline	2425	Ū
	83-32-9	Acenaphthene	10	Ū
'			COENINOS	-
		FORM I SV-1	C. C 11/18/0	OLM04

SAS No.:

EPA SAMPLE NO.

GW04PB

_Lab Name: COMPUCHEM Contract: OLM04-REVS

SDG No.: RW1067

-Matrix: (soil/water) WATER

Lab Code: LIBRTY Case No.:

Lab Sample ID: RW1067-4

Sample wt/vol:

1050 (g/mL) ML

Lab File ID: RW1067-4A66

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture:

decanted: (Y/N)

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH:

Extraction: (Type) CONT

- CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

10 10 10 10 10	U U U
10 10 10	U U
10 10	Ü
10	
	Ü
24 25	Ü
24-25	U
10	Ü
10	Ū
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10	U
10	Ū
10	U
10	Ū
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10	Ū
10	U
10	Ū
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FORM I SV-2

11/12/08 OLM04.2

1G

TENTATIVELY IDENTIFIED COMPOUNDS GW04PB

- :	Lab	Name:	COMPUCHE	М	Contract:	OLM04-REVS	l	
	- 1	G . 1	TTDDMI	~	 a. a		an.a	

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067 - Matrix: (soil/water) WATER Lab Sample ID: RW1067-4

Sample wt/vol: 1050 (g/mL) Lab File ID: RW1067-4A66 ML

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: Decanted: (Y/N) Date Extracted:09/20/02

Concentrated Extract Volume: Date Analyzed: 09/24/02 1000 (uL)

Dilution Factor: 1.0 Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N Extraction: (Type) CONT pH: ____

CONCENTRATION UNITS:

EPA SAMPLE NO.

Number TICs found: 6 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.61	6] ===== J
2.	UNKNOWN	9.45	5	J
T 3. 934-34-9	2 (3H) -BENZOTHIAZOLONE	11.59		NJ
4.	UNKNOWN	. 14.18	22	J
5. 80-05-7	PHENOL, 4,4'-(1-METHYLETHYLI-	14.48	3	NJ
6.	UNKNOWN	15.42	5	J
T				
8.				
9. 10.				
T 11.	<u> </u>			
12.	* 4,4'- (1-methylethylidene) his phen	0		
13.	4- 4-1 - C Methyletty Methyl Dis Differ			
_ 14.		COR 11/17/09		
15.				
16.				
17.				
T 18.		<u> </u>		
19.				
20.				
21.				
22.				
24.			·	
				
T_{26} .				
27.	<u> </u>			
28.		<u> </u>		
т 29.				
30.				

FORM I SV-TIC

EPA SAMPLE NO.

- Lab Name: COMPUCHEM Contract: OLM04-REVS

GW05PB

Lab Code: LIBRTY

Case No.:

SAS No.:

Cae 116/02 SDG No.: RW1067

- Matrix: (soil/water) WATER Lab Sample ID: RW1067-5

Sample wt/vol:

1050 (g/mL) ML

Lab File ID: RW1067-5A66

Level: (low/med) LOW Date Received: 09/19/02

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume:

2.0(uL)

decanted: (Y/N)___

Dilution Factor: 1.0

GPC Cleanup:

% Moisture:

(Y/N)

pH: ____

Extraction: (Type)

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

			· · · · · · · · · · · · · · · · · · ·	
	100-52-7	Benzaldehyde	10	U
	108-95-2	Phenol	10	Ū
	111-44-4	bis(2-Chloroethyl)ether	10	Ü
	95-57-8	2-Chlorophenol	10	Ü
	95-48-7	2-Methylphenol	10	Ü
Τ_	108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
1	98-86-2	Acetophenone	10	Ū
'—	106-44-5	4-Methylphenol	10	Ū
	621-64-7	N-Nitroso-di-n-propylamine	10	Ū
T^{-}	67-72-1	Hexachloroethane	10	Ū
I^-	98-95-3	Nitrobenzene	10	Ü
	78-59-1	Isophorone	10	Ū
	88-75-5	2-Nitrophenol	10	U
	105-67-9	2,4-Dimethylphenol	10	U
1-	111-91-1	bis(2-Chloroethoxy)methane	10	Ü
	120-83-2	2,4-Dichlorophenol	10	Ū
┱ ̄	91-20-3	Naphthalene	10	Ū
1	106-47-8	4-Chloroaniline	10	Ū
'-	87-68-3	Hexachlorobutadiene	10	Ū
	105-60-2	Caprolactam	10	Ū
┑ ̄	59-50-7	4-Chloro-3-methylphenol	10	U
	91-57-6	2-Methylnaphthalene	10	Ū
	77-47-4	Hexachlorocyclopentadiene	10	Ü
_	88-06-2	2,4,6-Trichlorophenol	10	Ū
1	95-95-4	2,4,5-Trichlorophenol	24 25	Ū
1	92-52-4	1,1'-Biphenyl	10	Ū
	91-58-7	2-Chloronaphthalene	10	U
¬ —	88-74-4	2-Nitroaniline	24 25	Ū
	131-11-3	Dimethylphthalate	10	U
1	606-20-2	2,6-Dinitrotoluene	10	U
	208-96-8	Acenaphthylene	10	U
٦_	99-09-2	3-Nitroaniline	24 25	U
1	83-32-9	Acenaphthene	10	Ū

FORM I SV-1

COE 11/18/02 OLM04.2

SAS No.:

EPA SAMPLE NO.

GW05PB

- Lab Name: COMPUCHEM Contract: OLM04-REVS

SDG No.: RW1067

-Matrix: (soil/water) WATER

Lab Sample ID: RW1067-5

Sample wt/vol:

Lab Code: LIBRTY

1050 (g/mL) ML Lab File ID: RW1067-5A66

Level: (low/med)

LOW

Date Received: 09/19/02

% Moisture:

decanted: (Y/N)___

Case No.:

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: ____

Extraction: (Type) CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

-	C1 00 C	1 0 (Dinitrophena)	1 377 AE	TT
_	51-28-5	2,4-Dinitrophenol	24, 25	U
P-	100-02-7	4-Nitrophenol	24 25	U
1_	132-64-9	Dibenzofuran	10	U
١.	121-14-2	2,4-Dinitrotoluene	10	Ü
	84-66-2	Diethylphthalate	10	Ū
	86-73-7	Fluorene	10	U
	7005-72-3	4-Chlorophenyl-phenylether	10	U
	100-01-6	4-Nitroaniline	a4 25	U
_	534-52-1	4,6-Dinitro-2-methylphenol	2425	Ū
	86-30-6	N-nitrosodiphenylamine (1)	10	Ü
	101-55-3	4-Bromophenyl-phenylether	10	Ü
	118-74-1	Hexachlorobenzene	10	U
	1912-24-9	Atrazine	10	U
	87-86-5	Pentachlorophenol	2425	U
1	85-01-8	Phenanthrene	10	Ü
-	120-12-7	Anthracene	10	U
_	86-74-8	Carbazole	10	Ū
1_	84-74-2	Di-n-butylphthalate	10	Ŭ
	206-44-0	Fluoranthene	10	Ū
_	129-00-0	Pyrene	10	U
	85-68-7	Butylbenzylphthalate	10	Ū
-	91-94-1	3,3'-Dichlorobenzidine	10	U
. —	56-55-3	Benzo(a)anthracene	10	U
	218-01-9	Chrysene	10	Ū
	117-81-7	bis(2-Ethylhexyl)phthalate	10 0.8 -	& U
	117-84-0	Di-n-octylphthalate	10	Ū
_	205-99-2	Benzo(b)fluoranthene	10	Ü
_	207-08-9	Benzo(k)fluoranthene	10	U
_	50-32-8	Benzo(a)pyrene	10	Ū
_	193-39-5		10	Ū
-	53-70-3	Dibenzo (a, h) anthracene	10	Ū
	191-24-2	Benzo(g,h,i)perylene	10	Ū ,
		annot be separated from Diphenylamine	CaEriKSON	במ אבולונ
		1 1	CACALTOR	סטופוןיי

FORM I SV-2

TENTATIVELY IDENTIFIED COMPOUNDS

GW05PB

– Lab	Name:	COMPUCHEM	

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RW1067

EPA SAMPLE NO.

-Matrix: (soil/water) WATER

Lab Sample ID: RW1067-5

Sample wt/vol: 1050 (g/mL)

ML

Lab File ID: RW1067-5A66

Level: (low/med)

LOW

Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___

Date Extracted:09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N)

N

pH: ___

Extraction: (Type) CONT

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	11.60	2]===== J
2.	ONGIONI	11.00		
_ 3.				
4.				·
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13. _14.			···	
14.		·		
15.				
16.				
17.				
$-\frac{18}{19}$.			<u> </u>	
20				
20. 21.				
$\frac{21}{22}$.				
23.				
24.				
_25.				
26.				
27.				
28.				
$-\frac{29}{29}$.			-	
30.				

FORM I SV-TIC

EPA SAMPLE NO.

-Lab Name: COMPUCHEM Contract: OLM04-REVS GW06PB

Lab Code: LIBRTY

Case No.:

SAS No.:

CAE 116/02/ SDG No.: RW1067

Matrix: (soil/water) WATER

Lab Sample ID: RW1067-6

Sample wt/vol:

1075 (g/mL) ML Lab File ID: RW1067-6A66

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture:

decanted: (Y/N)

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N)

pH: ____

Extraction: (Type)

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

_	100-52-7	Benzaldehyde	9 10	Ü
	108-95-2	Phenol	, 10	Ū
	111-44-4	bis(2-Chloroethyl)ether	10	U
	95-57-8	2-Chlorophenol	1.0	Ū
	95-48-7	2-Methylphenol	10	Ū
	108-60-1	2,2'-oxybis(1-Chloropropane)	1 10	U
	98-86-2	Acetophenone	110	U
١	106-44-5	4-Methylphenol	10	Ū
_	621-64-7	N-Nitroso-di-n-propylamine	10	Ū
	67-72-1	Hexachloroethane	10	Ū
	98-95-3	Nitrobenzene	10	Ū
	78-59-1	Isophorone	1.0	Ü
	88-75-5	2-Nitrophenol	10	Ū
	105-67-9	2,4-Dimethylphenol	10	Ū
	111-91-1	bis(2-Chloroethoxy)methane	10	Ū_
	120-83-2	2,4-Dichlorophenol	10	U
Γ_	91-20-3	Naphthalene	10	Ü
	106-47-8	4-Chloroaniline	1.0	Ū
	87-68-3	Hexachlorobutadiene	10	U
	105-60-2	Caprolactam	\ 10	U
	59-50-7	4-Chloro-3-methylphenol	10	U
	91-57-6	2-Methylnaphthalene	10	U
	77-47-4	Hexachlorocyclopentadiene	10	U
	88-06-2	2,4,6-Trichlorophenol	Ψ 10	U
1	95-95-4	2,4,5-Trichlorophenol	23 25	U
!	92-52-4	1,1'-Biphenyl	9 10	Ū
	91-58-7	2-Chloronaphthalene	9 10	Ū
T	88-74-4	2-Nitroaniline	2325	Ü
	131-11-3	Dimethylphthalate	9 10	U
	606-20-2	2,6-Dinitrotoluene	/ 10	Ū
	208-96-8	Acenaphthylene	↓ 10	Ū
T	99-09-2	3-Nitroaniline	23 25	U
	83-32-9	Acenaphthene	9 10	U
			MC ivini)	

FORM I SV-1

EPA SAMPLE NO.

- Lab Name: COMPUCHEM Contract: OLM04-REVS GW06PB

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-6

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-6A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N) ___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Extraction: (Type) CONT

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

			1 77
51-28-5	2,4-Dinitrophenol	23 25	Ü
100-02-7	4-Nitrophenol	23-25	Ü
132-64-9	Dibenzofuran	9 10	U
121-14-2	2,4-Dinitrotoluene		Ü
84-66-2	Diethylphthalate	1-0	U
86-73-7	Fluorene	10	Ü
7005-72-3	4-Chlorophenyl-phenylether	₩ 1 0	U
100-01-6	4-Nitroaniline	23 25	Ü
534-52-1	4,6-Dinitro-2-methylphenol	23 2 5	Ü
86-30-6	N-nitrosodiphenylamine (1)	9 10	U
101-55-3	4-Bromophenyl-phenylether	, 10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	V 10	U
87-86-5	Pentachlorophenol	23 2 5	U
85-01-8	Phenanthrene	9 10	U
120-12-7	Anthracene	/ 10	Ū
86-74-8	Carbazole	∀ -±0	U
84-74-2	Di-n-butylphthalate	0.2	J
206-44-0	Fluoranthene	910	U
129-00-0	Pyrene	1 0	Ū
85-68-7	Butylbenzylphthalate	10	Ū
91-94-1	3,3'-Dichlorobenzidine	10	Ū
56-55-3	Benzo(a) anthracene	10	Ū
218-01-9	Chrysene	10	Ū
117-81-7	bis(2-Ethylhexyl)phthalate	10	Ū
117-84-0	Di-n-octylphthalate	10	Ū
205-99-2	Benzo(b) fluoranthene	10	Ū
207-08-9	Benzo(k) fluoranthene	10	Ū
50-32-8	Benzo (a) pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo (a, h) anthracene	1-0	U
191-24-2	Benzo(g,h,i)perylene	¥ 10	Ü
	man be a second of the Disher of the second		

(1) - Cannot be separated from Diphenylamine

(DE 11/14/02

FORM I SV-2

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW06PB

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY

Case No.:

LOW

SAS No.:

SDG No.: RW1067

Matrix: (soil/water) WATER

Lab Sample ID: RW1067-6

Sample wt/vol: 1075

(q/mL)

Lab File ID: RW1067-6A66

Level:

(low/med)

Date Received: 09/19/02

% Moisture:

Decanted: (Y/N)

ML

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

_ Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N)

N

pH:

Extraction: (Type) CONT

CONCENTRATION UNITS:

Number TICs found: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.26	. 3	J
2.	UNKNOWN	5.53	4	J
3.	UNKNOWN	6.32	, 3	J
4.	UNKNOWN	7.62	, 3	J
5.	UNKNOWN	8.69	.4	J
6. 85-44-9	PHTHALIC ANHYDRIDE	9.01	3	NJ
7.	UNKNOWN	9.14	.4	J
8.	UNKNOWN	9.46	3	J
9.	UNKNOWN	9.63	3	J
r 10.	UNKNOWN	11.08	4	J
11.	UNKNOWN	11.19	. 3	J
12.	UNKNOWN	11.24	.3	J
13.	UNKNOWN	12.82	, 3	J
14. 13014-18-1	BENZENE, 2,4-DICHLORO-1-(TRI	* 13.21	5	NJ
15. 115-28-6	BICYCLO[2.2.1] HEPT-5-ENE-2,3	** 13.53		NJ
16.	UNKNOWN	13.57	3	J
17.	UNKNOWN	14.17	22	J
18.	UNKNOWN	14.29	3	J
19.	UNKNOWN	14.34	4	Ĵ
20.	UNKNOWN	14.39	5	J
- 21.	UNKNOWN	15.15	3	J
22.	UNKNOWN	15.19	. 3	J
23.	UNKNOWN	15.24	, 3	J
24.	UNKNOWN	15.29	4	J
25.	UNKNOWN	15.37	7	J
26.	UNKNOWN	15.61		J
27.	UNKNOWN	15.64		J
_ 28.	UNKNOWN	15.69		Ĵ
29.	UNKNOWN	16.54		J
30.	UNKNOWN	18.45	2	J

FORM I SV-TIC

OLM04.2

* 2,4-dichloro-1-(trichloromethyl) benzene ** 1,4,5,4,7,7-hexachloro-bicyclo[2.2.1] hept-5-ene -2,3-dicarboxylic acid

@E11/12/02 28

EPA SAMPLE NO.

GW02PB Contract: OLM04-REVS ONE 11/6/02 SDG No.: RW1067 SAS No.:

Matrix: (soil/water) WATER Lab Sample ID: RW1067-2

- Lab Name: COMPUCHEM

Lab Code: LIBRTY Case No.:

Sample wt/vol: $1075 \quad (q/mL) \quad ML$ Lab File ID: RW1067-2A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Date Extracted: 09/20/02 decanted: (Y/N)

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/24/02

Dilution Factor: 1.0 Injection Volume: 2.0 (uL)

GPC Cleanup: Extraction: (Y/N) pH: ____ (Type) CONT

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

100-52-7	Benzaldehyde	9 10	Ū
108-95-2	Phenol	, 10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	Ū
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
98-86-2	Acetophenone	10	Ū
106-44-5	4-Methylphenol	10	Ū
621-64-7	N-Nitroso-di-n-propylamine	10	Ū
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	Ū
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	(10	Ū
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	Ū
106-47-8	4-Chloroaniline	10	Ū
87-68-3	Hexachlorobutadiene	10	Ū
105-60-2	Caprolactam	10	Ū
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	110	Ü
95-95-4	2,4,5-Trichlorophenol	2325	U
92-52-4	1,1'-Biphenyl	9 10	Ū
91-58-7	2-Chloronaphthalene	910	U
88-74-4	2-Nitroaniline	2325	Ū
131-11-3	Dimethylphthalate	9 10	U
606-20-2	2,6-Dinitrotoluene	910	U
208-96-8	Acenaphthylene	9 10	U
99-09-2	3-Nitroaniline	2325	U
83-32-9	Acenaphthene	910-	U
	FORM I SV-1	CaEIIlIDOS	OLM04.

SAS No.:

EPA SAMPLE NO.

GW02PB

- Lab Name: COMPUCHEM Contract: OLM04-REVS

SDG No.: RW1067

Matrix: (soil/water) WATER

Lab Code: LIBRTY Case No.:

Lab Sample ID: RW1067-2

Sample wt/vol: 1075

(g/mL) ML

Lab File ID: RW1067-2A66

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture:

decanted: (Y/N)___

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N pH:

Extraction: (Type)

CONT

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

		1	
51-28-5	2,4-Dinitrophenol	23 25	U
100-02-7	4-Nitrophenol	23 25	U
132-64-9	Dibenzofuran	9 10	U
121-14-2	2,4-Dinitrotoluene	10	Ū
84-66-2	Diethylphthalate	10	Ü
86-73-7	Fluorene	10	Ū
7005-72-3	4-Chlorophenyl-phenylether	¥ 1-0	U
100-01-6	4-Nitroaniline	23 2 5	Ū
534-52-1	4,6-Dinitro-2-methylphenol	23 2 5	Ū
86-30-6	N-nitrosodiphenylamine (1)	9 10	Ū
101-55-3	4-Bromophenyl-phenylether	10	Ū
118-74-1	Hexachlorobenzene	10	Ū
_ 1912-24-9	Atrazine	↓ 10	Ū
87-86-5	Pentachlorophenol	23 25	Ū
85-01-8	Phenanthrene	9 10	Ū
120-12-7	Anthracene	, 10	U
86-74-8	Carbazole	1-0	Ū
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	Ū
129-00-0	Pyrene	10	Ū
85-68-7	Butylbenzylphthalate	10	Ū
91-94-1	3,3'-Dichlorobenzidine	10	Ū
56-55-3	Benzo(a)anthracene	10	Ū
_ 218-01-9	Chrysene	¥ 10	Ū
117-81-7	bis(2-Ethylhexyl)phthalate	9-2	J U
117-84-0	Di-n-octylphthalate	, 10	Ū
205-99-2	Benzo(b)fluoranthene	10	Ū
- 207-08-9	Benzo(k) fluoranthene	10	Ū
50-32-8	Benzo(a)pyrene	10	Ū
193-39-5	Indeno(1,2,3-cd)pyrene	1-0	U
53-70-3	Dibenzo(a, h) anthracene	1.0	Ū
191-24-2	Benzo(q,h,i)perylene	V 10	Ū
(1) - Ca	nnot be separated from Diphenylamine	CREILLINOX	· ·

CREMINOY

FORM I SV-2

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

SAS No.:

EPA SAMPLE NO.

SDG No.: RW1067

				GW02PB
- Lab Name:	COMPUCHEM	Contract:	OLM04-REVS	

Matrix: (soil/water) WATER Lab Sample ID: RW1067-2

Lab Code: LIBRTY Case No.:

Sample wt/vol: 1075 (q/mL) MLLab File ID: RW1067-2A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: Decanted: (Y/N) Date Extracted: 09/20/02

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/24/02

Dilution Factor: 1.0 Injection Volume: 2.0 (uL)

GPC Cleanup: (Y/N) N Extraction: (Type) CONT pH:___

CONCENTRATION UNITS: Number TICs found: 2 (ug/L or ug/Kg) UG/L

	 	1		
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q =====
1.	UNKNOWN	5.39	3	J
2.	UNKNOWN	17.96	2	J
т 3.				
4.				
5.				
6.				
7.				
9.				
10.				
111.				
12.				
13.				
т 14.				
15.				
16.				
17.				
18.				
19.				
20.				
22.				
23.				
24.				
- 25.				
26.				
27.		· · · · · · · · · · · · · · · · · · ·		
28.				
T 29.				
30.				

FORM I SV-TIC

- Lab Name: COMPUCHEM

Contract: OLM04-REVS

MB-IO

(AE II | OP

SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-1

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RW1067-1A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: decanted: (Y/N) Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Extraction: (Type) CONT

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L (

	100-52-7	Benzaldehyde	9 10	Ü
	108-95-2	Phenol	, 10	Ū
	111-44-4	bis(2-Chloroethyl)ether	\ 10	Ū
	95-57-8	2-Chlorophenol	120	Ŭ
	95-48-7	2-Methylphenol	10	Ū
т	108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
!	98-86-2	Acetophenone	110	Ū
'	106-44-5	4-Methylphenol	10	Ū
e	621-64-7	N-Nitroso-di-n-propylamine	1-0	U
Τ	67-72-1	Hexachloroethane	10	Ū
	98-95-3	Nitrobenzene	10	Ū
	78-59-1	Isophorone	1 10	Ü
	88-75-5	2-Nitrophenol	10	Ū
	105-67-9	2,4-Dimethylphenol	10	Ŭ
	111-91-1	bis(2-Chloroethoxy)methane	1.0	U
	120-83-2	2,4-Dichlorophenol	10	U
г	91-20-3	Naphthalene	10	U
	106-47-8	4-Chloroaniline	10	U
	87-68-3	Hexachlorobutadiene	1.0	U
]	105-60-2	Caprolactam	1.0	Ü
Γ	59-50-7	4-Chloro-3-methylphenol	10	U
	91-57-6	2-Methylnaphthalene	1.0	Ū
	77-47-4	Hexachlorocyclopentadiene	10	U
	88-06-2	2,4,6-Trichlorophenol	10	U
	95-95-4	2,4,5-Trichlorophenol	23 -25	U
1	92-52-4	1,1'-Biphenyl	9 10	Ū
	91-58-7	2-Chloronaphthalene	910	U
	88-74-4	2-Nitroaniline	23.25	U
	131-11-3	Dimethylphthalate	9 10	U
$\overline{\epsilon}$	506-20-2	2,6-Dinitrotoluene	110	U
2	208-96-8	Acenaphthylene	¥ 10	Ū
	99-09-2	3-Nitroaniline	23 2 5	U
	83-32-9	Acenaphthene	9 10	U

FORM I SV-1

(NE 11/12/07 OLM04.2

SAS No.:

EPA SAMPLE NO.

GW01PB

- Lab Name: COMPUCHEM Contract: OLM04-REVS

SDG No.: RW1067

Matrix: (soil/water) WATER

Lab Code: LIBRTY Case No.:

Lab Sample ID: RW1067-1

Sample wt/vol: 1100 (g/mL) ML

Lab File ID: RW1067-1A66

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture:

decanted: (Y/N)____

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: ____

Extraction: (Type) CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	51-28-5	2,4-Dinitrophenol	23 25	Ŭ
т.	100-02-7	4-Nitrophenol	23 25	Ü
-	132-64-9	Dibenzofuran	9 10	U
	121-14-2	2,4-Dinitrotoluene	10	U
	84-66-2	Diethylphthalate	1-0	U
T	86-73-7	Fluorene	10	Ū
_	7005-72-3	4-Chlorophenyl-phenylether	¥ 10	U
	100-01-6	4-Nitroaniline	23 2 5	U
	534-52-1	4,6-Dinitro-2-methylphenol	23 25	Ü
T	86-30-6	N-nitrosodiphenylamine (1)	q 1 0	Ū
1_	101-55-3	4-Bromophenyl-phenylether	110	Ü
	118-74-1	Hexachlorobenzene	10	Ū
	1912-24-9	Atrazine	↓1 0	Ū
T	87-86-5	Pentachlorophenol	23 25	U
1-	85-01-8	Phenanthrene	910	Ū
-	120-12-7	Anthracene	, 10	Ū
	86-74-8	Carbazole	10	Ū
-	84-74-2	Di-n-butylphthalate	1-0	U
I — —	206-44-0	Fluoranthene	1-0	Ū
	129-00-0	Pyrene	10	Ū
T	85-68-7	Butylbenzylphthalate	1-0	Ū
-	91-94-1	3,3'-Dichlorobenzidine	1-0	Ū
٠	56-55-3	Benzo(a)anthracene	10	U
	218-01-9	Chrysene	10	Ū
T	117-81-7	bis(2-Ethylhexyl)phthalate	9-2	ਚ ਪ
T-	117-84-0	Di-n-octylphthalate	, 10	U
	205-99-2	Benzo(b) fluoranthene	110	U
	207-08-9	Benzo(k)fluoranthene	10	U
	50-32-8	Benzo (a) pyrene	1-0	Ū
	193-39-5	Indeno(1,2,3-cd)pyrene	1-0	Ū
	53-70-3	Dibenzo (a, h) anthracene	1-0	U
T	191-24-2	Benzo(g,h,i)perylene	10	U
'		annot be separated from Diphenylamine	me ulustan	

FORM I SV-2

(DE 11/12/08

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RW1067

EPA SAMPLE NO.

Matrix: (soil/water) WATER

Lab Sample ID: RW1067-1

Sample wt/vol: 1100 (q/mL)

Lab File ID: RW1067-1A66

Level: (low/med)

LOW

Date Received: 09/19/02

% Moisture: ____ Decanted: (Y/N) ___ Date Extracted:09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: ____

ML

Extraction: (Type) CONT

CONCENTRATION UNITS:

Number TICs found:

(ug/L or ug/Kg) UG/L RT CAS NUMBER COMPOUND NAME EST. CONC.

' 1.	UNKNOWN	5.40	2 J
2.	UNKNOWN	5.80	78 J
Т 3.	UNKNOWN	6.73	5 J
4.	UNKNOWN	8.72	10 J
5.	UNKNOWN	9.23	4 J
6. 134-62-3	DIETHYLTOLUAMIDE	10.90	9 N J
7.			
8.			
9.			
_ 10.			
11.			
12.			
13.			
- 14.			
15.			
16.			
17.			
18.			
19.			
20.			
_ 21.			
22.			
23.			
24.			
- 25.			
26.			
27.			
28.			
29.			
			

FORM I SV-TIC

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW09FBPB Field Blank SDG No.: RW1067

Contract: OLM04-REVS

SAS No.: Case No.:

Lab Sample ID: RW1067-10

Matrix: (soil/water) WATER

1125 (g/mL) ML

Lab File ID: RW1067-10A66

Level:

(low/med) LOW

Date Received: 09/19/02

% Moisture:

Lab Name: COMPUCHEM

Lab Code: LIBRTY

Sample wt/vol:

decanted: (Y/N)

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/24/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N pH: ___

Extraction: (Type)

CONT

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

100 50	Z I David I de books	0.10	***
100-52-		9 10	Ü
T 108-95-		, 10	Ū
111-44-		10	U
95-57-		10	U
95-48-		10	U
108-60-		10	Ū
98-86-		10	U
106-44-		10	U
621-64-	7 N-Nitroso-di-n-propylamine	10	U
67-72-		10	Ü
98-95-		1.0	Ū
78-59-		10	Ū
88-75-		110	Ū
105-67-		1-0	U
111-91-	1 bis(2-Chloroethoxy)methane	1.0	U
120-83-		10	Ū
7 91-20-	3 Naphthalene	10	Ū
106-47-	8 4-Chloroaniline	1 120	Ū
87-68-	3 Hexachlorobutadiene	10	Ū
105-60-		10	Ū
59-50-	7 4-Chloro-3-methylphenol	1.0	Ū
91-57-		10	Ū
77-47-	4 Hexachlorocyclopentadiene	10	U
88-06-		V 10	Ū
95-95-	4 2,4,5-Trichlorophenol	عدر 25	U
92-52-		9 10	U
91-58-		910	Ū
88-74-		22 25	Ū
131-11-		910	Ū
606-20-		120	Ū
208-96-		1 10	U
99-09-		22 25	U
83-32-	9 Acenaphthene	9 10	Ü
			'

FORM I SV-1

CREIllirlor

1D SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Contract: OLM04-REVS GW09FBPB

- Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

- Matrix: (soil/water) WATER Lab Sample ID: RW1067-10

Sample wt/vol: 1125 (g/mL) ML Lab File ID: RW1067-10A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: decanted: (Y/N) Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO. COMPOUND CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

_	51-28-5	2,4-Dinitrophenol	22 2 5	U
_	100-02-7	4-Nitrophenol	22 2 5	Ū
7-	132-64-9	Dibenzofuran	9 10	Ū
-	121-14-2	2,4-Dinitrotoluene	, 10	Ū
_	84-66-2	Diethylphthalate	10	Ū
~	86-73-7	Fluorene	1.0	U
- -	7005-72-3	4-Chlorophenyl-phenylether	¥ 10	Ū
,	100-01-6	4-Nitroaniline	22 2 5	Ū
_	534-52-1	4,6-Dinitro-2-methylphenol	22.25	Ū
T	86-30-6	N-nitrosodiphenylamine (1)	910	Ū
-	101-55-3	4-Bromophenyl-phenylether	10	Ū
. –	118-74-1	Hexachlorobenzene	10	Ū
_	1912-24-9	Atrazine	√ 10	Ū
T	87-86-5	Pentachlorophenol	22 25	Ū
1-	85-01-8	Phenanthrene	9 10	Ū
_	120-12-7	Anthracene	, 10	Ū
	86-74-8	Carbazole	(10)	U
[~	84-74-2	Di-n-butylphthalate) 10	Ū
1-	206-44-0	Fluoranthene	10	Ū
	129-00-0	Pyrene	10	Ū
T	85-68-7	Butylbenzylphthalate	10	Ū
-	91-94-1	3,3'-Dichlorobenzidine	10	U
	56-55-3	Benzo(a)anthracene	10	U
_	218-01-9	Chrysene	¥ 10	Ū
7~	117-81-7	bis(2-Ethylhexyl)phthalate	0.6	J
-	117-84-0	Di-n-octylphthalate	9 10	U
_	205-99-2	Benzo(b) fluoranthene	, 10	Ū
 -	207-08-9	Benzo(k)fluoranthene	10	Ū
-	50-32-8	Benzo(a)pyrene	1.0	Ū
!	193-39-5	Indeno(1,2,3-cd)pyrene	10	Ü
_	53-70-3	Dibenzo (a, h) anthracene	1-0	Ū
_~	191-24-2	Benzo(g,h,i)perylene	₩ 10	U
_	/1\ C-	nnot be generated from Diphenylamine		 ·

(1) - Cannot be separated from Diphenylamine

ME 11/12/02

FORM I SV-2

1G SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

GW09FBPB

EPA SAMPLE NO.

-	Lab Name: COMPUCHEM	Contract: OLM04-REVS	
	Lab Code: LIBRTY Case No.:	SAS No.:	DG No.: RW1067
_	Matrix: (soil/water) WATER	Lab Sample ID: R	W1067-10
	Sample wt/vol: 1125 (g/mL) ML	Lab File ID: RW	1067-10 A 66
-	Level: (low/med) LOW	Date Received: 0	9/19/02
	% Moisture: Decanted: (Y/N)	Date Extracted:09/	20/02
-	Concentrated Extract Volume: 1000	(uL) Date Analyzed: 0	9/24/02
	Injection Volume: 2.0(uL)	Dilution Factor:	1.0
_	GPC Cleanup: (Y/N) N pH:	Extraction: (Type	e) CONT

CONCENTRATION UNITS: - Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				====
2.				
4.				
5.				
7.				
8.				<u> </u>
10.				
$\begin{bmatrix} \frac{11}{12}. \\ 12. \end{bmatrix}$				
13. 14.				
15.				
16. 17.				
18.				
19. 20.				
21.				
22.				
24.				
25. 26.				
27.				
28. T 29.				
30.				

FORM I SV-TIC

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

. Lab Name: COMPUCHEM

Contract: OLM04-REVS

PW01PB Ca8116/02

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RU1067

- Matrix: (soil/water) WATER

Lab Sample ID: RU1067-5

Sample wt/vol:

(g/mL) ML 1100

Lab File ID: RU1067-5A66

Level: (low/med)

Date Received: 09/19/02

% Moisture:

decanted: (Y/N)

LOW

N

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/23/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

Extraction:

GPC Cleanup:

(Y/N)

pH:

6.0

(Type)

CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

	100-52-7	Benzaldehyde	9 10	Ū
_	108-95-2	Phenol	7 10	Ü
T	111-44-4	bis(2-Chloroethyl)ether	(10	Ŭ
-	95-57-8	2-Chlorophenol	10	Ŭ
·	95-48-7	2-Chlorophenol 2-Methylphenol	10	Ü
	108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ü
7-	98-86-2	Acetophenone	10	U
	106-44-5	4-Methylphenol	10	Ü
	621-64-7	N-Nitroso-di-n-propylamine	10	Ü
\neg^-	67-72-1	Hexachloroethane	1-0	U
-	98-95-3	Nitrobenzene	10	Ū
	78-59-1	Isophorone	10	U
	88-75-5	2-Nitrophenol	10	Ū
T^-	105-67-9	2,4-Dimethylphenol	10	Ū
-	111-91-1	bis(2-Chloroethoxy)methane	10	Ū
	120-83-2	2,4-Dichlorophenol	10	Ū
	91-20-3	Naphthalene	10	Ū
	106-47-8	4-Chloroaniline	10	Ū
-	87-68-3	Hexachlorobutadiene	10	Ū
	105-60-2	Caprolactam	10	Ū
┯ ̄	59-50-7	4-Chloro-3-methylphenol	10	Ū
-	91-57-6	2-Methylnaphthalene	10	Ü
,	77-47-4	Hexachlorocyclopentadiene	1. 10	Ū
	88-06-2	2,4,6-Trichlorophenol	10	U
T^-	95-95-4	2,4,5-Trichlorophenol	23 25	Ū
-	92-52-4	1,1'-Biphenyl	9 10	Ū
	91-58-7	2-Chloronaphthalene	9±0	Ū
	88-74-4	2-Nitroaniline	23 25	U
1-	131-11-3	Dimethylphthalate	9 10	Ū
1-	606-20-2	2,6-Dinitrotoluene	710	U
_	208-96-8	Acenaphthylene	√ 10	Ū
┰	99-09-2	3-Nitroaniline	23 25	Ū
1	83-32-9	Acenaphthene	9 10	U
		FORM I SV-1	(2E11/17/02	OLM04.

1D SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SDG No.: RU1067

Contract: OLM04-REVS PW01PB

Lab Name: COMPUCHEM Contract: OLM04-RE

Lab Code: LIBRTY Case No.: SAS No.:

- Matrix: (soil/water) WATER Lab Sample ID: RU1067-5

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-5A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: decanted: (Y/N) ___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

51-2		2,4-Dinitrophenol	23 25	U
100-0		4-Nitrophenol	23-25	Ü
132-6		Dibenzofuran	9 10	U
121-1		2,4-Dinitrotoluene	10	U
84-6		Diethylphthalate	10	Ū
86-7	3-7	Fluorene	10	Ū
7005-7	2-3	4-Chlorophenyl-phenylether	10	Ū
100-0	1-6	4-Nitroaniline	23 25	Ū
534-5		4,6-Dinitro-2-methylphenol	23-25	Ū
7 86-3	0-6	N-nitrosodiphenylamine (1)	4 10	Ū
101-5	5-3	4-Bromophenyl-phenylether	110	Ū
118-7		Hexachlorobenzene	1.0	U
1912-2	4-9	Atrazine	↓ 10	Ū
T 87-8	6-5	Pentachlorophenol	23,25	Ū
85-0	1-8	Phenanthrene	9 10	Ū
120-1		Anthracene	10	Ū
_ 86-7	4-8	Carbazole	10	Ū
84-74		Di-n-butylphthalate	110	Ū
206-4	4-0	Fluoranthene	10	Ū
129-0	0-0	Pyrene	10	Ū
7 85-6	8-7	Butylbenzylphthalate	10	Ū
91-94	4-1	3,3'-Dichlorobenzidine	1.0	U
56-5		Benzo (a) anthracene	10	Ū
218-0		Chrysene	10	Ū
T 117-8:		bis(2-Ethylhexyl)phthalate	10	U
117-84		Di-n-octylphthalate	10	Ū
205-99		Benzo(b) fluoranthene	1-0	U
_ 207-0		Benzo(k)fluoranthene	10	U
T 50-3		Benzo(a)pyrene	1-0	U
193-3		Indeno(1,2,3-cd)pyrene	10	U
53-7		Dibenzo (a, h) anthracene	1 10	Ū
т 191-24		Benzo(g,h,i) perylene	10	U
		annot be separated from Diphenylamine		

(1) - Cannot be separated from Diphenylamine

caeillistos

FORM I SV-2

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

PW01PB	
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- Lab Name: COMPUCHEM

Lab Code: LIBRTY

Contract: OLM04-REVS

Case No.:

SAS No.:

SDG No.: RU1067

Matrix: (soil/water) WATER

ML

Lab Sample ID: RU1067-5

Sample wt/vol: 1100 (q/mL)

Lab File ID: RU1067-5A66

Level: (low/med)

Concentrated Extract Volume:

LOW

Date Extracted: 09/20/02

_____ Decanted: (Y/N)___

1000 (uL)

Date Analyzed: 09/23/02

Date Received: 09/19/02

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 6.0

Extraction: (Type) CONT

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -79-34-5	ETHANE, 1,1,2,2-TETRACHLORO	5.01	2	NJ
2. 134-62-3	DIETHYLTOLUAMIDE	10.90	2	NJ
3.				Ca
4.				الم
5.				
6.				
7.				
8. 9.				
10.				
11.				
12.	· · · · · · · · · · · · · · · · · · ·			
13.				<u> </u>
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23.				
24.				
25.	····			
26. 27.				
28.				
29.				
30.				

FORM I SV-TIC

ALKANE NARRATIVE REPORT Report date : 10/02/2002 SDG: RU1067

lient Sample	ID: PW01PB Lab Samp	le ID: RU1067-5	File	ID: RU1067-5A66
Tompound	PW-1 caevilylor	RT Est.	Conc.	Q
traight-Chain			3	J

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01PB

Contract: OLM04-REVS

Lab Name: COMPUCHEM

Lab Code: LIBRTY Case No.:

SAS No.:

CAE 11/0/02 SDG No.: RU1067

Matrix: (soil/water) WATER

1050 (g/mL) ML Lab File ID: RU1067-1A66

Sample wt/vol:

Level: (low/med) LOW

Date Received: 09/19/02

Lab Sample ID: RU1067-1

% Moisture:

decanted: (Y/N)

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/23/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

Extraction: (Type)

CONT

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

-	100-52-7	Benzaldehyde	10	U
	108-95-2	Phenol	10	Ū
٦	111-44-4	bis(2-Chloroethyl)ether	10	Ū
1	95-57-8	2-Chlorophenol	10	Ū
- 1	95-48-7	2-Methylphenol	10	U
4	108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ū
	98-86-2	Acetophenone	10	Ū
1	106-44-5	4-Methylphenol	10	Ū
į	621-64-7	N-Nitroso-di-n-propylamine	10	Ū
\dashv	67-72-1	Hexachloroethane	10	U
1	98-95-3	Nitrobenzene	10	Ū
	78-59-1	Isophorone	10	Ū
	88-75-5	2-Nitrophenol	10	Ū
٦	105-67-9	2,4-Dimethylphenol	10	U
- [111-91-1	bis(2-Chloroethoxy)methane	10	U
	120-83-2	2,4-Dichlorophenol	10	Ū
	91-20-3	Naphthalene	10	Ū
	106-47-8	4-Chloroaniline	10	U
1	87-68-3	Hexachlorobutadiene	10	U
	105-60-2	Caprolactam	10	U
\neg	59-50-7	4-Chloro-3-methylphenol	10	Ū
	91-57-6	2-Methylnaphthalene	10	U
•	77-47-4	Hexachlorocyclopentadiene	10	U
	88-06-2	2,4,6-Trichlorophenol	10	Ū
	95-95-4	2,4,5-Trichlorophenol	24-25	Ü
- 1	92-52-4	1,1'-Biphenyl	10	Ü
	91-58-7	2-Chloronaphthalene	10	U
_	88-74-4	2-Nitroaniline	24 25	U
- [131-11-3	Dimethylphthalate	10	Ū
Į,	606-20-2	2,6-Dinitrotoluene	10	U
	208-96-8	Acenaphthylene	10	U
\neg	99-09-2	3-Nitroaniline	24 2 5	Ū
-	83-32-9	Acenaphthene	10	U
•			cae11/18/02	
		FORM I SV-1	11/10/00	OLM04.

1D SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Contract: OLM04-REVS

SW01PB

Lab Code: LIBRTY Case No.:

Lab Name: COMPUCHEM

SAS No.:

SDG No.: RU1067

- Matrix: (soil/water) WATER

Lab Sample ID: RU1067-1

Sample wt/vol:

1050 (g/mL) ML

Lab File ID: RU1067-1A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture:

decanted: (Y/N)

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/23/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

Extraction: (Type) CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>

, -	51-28-5	2,4-Dinitrophenol	24 25	Ū
•	100-02-7	4-Nitrophenol	24-25	Ŭ
٦-	132-64-9	Dibenzofuran	7 10	Ū
- -	121-14-2	2,4-Dinitrotoluene	10	Ū
	84-66-2	Diethylphthalate	10	Ū
-	86-73-7	Fluorene	10	Ū
7	7005-72-3	4-Chlorophenyl-phenylether	10	Ū
-	100-01-6	4-Nitroaniline	24, 25	Ū
-	534-52-1	4,6-Dinitro-2-methylphenol	24 25	Ū
¬¯	86-30-6	N-nitrosodiphenylamine (1)	10	Ū
	101-55-3	4-Bromophenyl-phenylether	10	U
1-	118-74-1	Hexachlorobenzene	10	Ū
-	1912-24-9	Atrazine	10	Ü
٦	87-86-5	Pentachlorophenol	24 25	U
	85-01-8	Phenanthrene	10	U
	120-12-7	Anthracene	10	U
	86-74-8	Carbazole	10	Ü
7	84 - 74 - 2	Di-n-butylphthalate	10	Ü
- 1	206-44-0	Fluoranthene	10	U
	129-00-0	Pyrene	10	U
~_	85-68-7	Butylbenzylphthalate	10	U
	91-94-1	3,3'-Dichlorobenzidine	10	Ü
, -	56-55-3	Benzo(a)anthracene	10	Ū
	218-01-9	Chrysene	10	U
ד <u>ֿ</u>	117-81-7	bis(2-Ethylhexyl)phthalate	10	U
1	117-84-0	Di-n-octylphthalate	10	U
_	205-99-2	Benzo(b)fluoranthene	10	U
	207-08-9	Benzo(k)fluoranthene	10	Ü
7	50-32-8	Benzo(a)pyrene	10	Ū
١٦	193-39-5	Indeno(1,2,3-cd)pyrene	10	U
-	53-70-3	Dibenzo(a,h)anthracene	10	U
	191-24-2	Benzo(g,h,i)perylene	10	Ū
	(1) - Ca	annot be separated from Diphenylamine	COEI/11302	•

FORM I SV-2

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

. I	1	
	SW01PB	

EPA SAMPLE NO.

Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: RU1067

- Matrix: (soil/water) WATER

Lab Sample ID: RU1067-1

Sample wt/vol: 1050 (q/mL)

ML

Lab File ID: RU1067-1A66

Level: (low/med)

LOW

Date Received: 09/19/02

Decanted: (Y/N)

Date Extracted:09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/23/02

Injection Volume:

2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 7.0

Extraction: (Type) CONT

CONCENTRATION UNITS:

- Number TICs found: 0 (ug/L or ug/Kg) UG/L

1. 2. 3. 4. 5. 6. 7. 7. 8. 9. 10. 11. 12. 13. 14. 15. 15. 16. 17. 18. 17. 18. 19. 19. 19. 19. 19. 19. 19. 19. 19. 19	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
2. 3. 4. 5. 6. 7. 8. 9. 10. Til. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28.		<u></u>	=======		====
3. 4. 5. . 6. . 7. . 8. . 9. . 10. . 11. . 12. . 13. . 14. . 15. . 16. . 17. . 18. . 19. . 20. . 21. . -22. . 23. . 24. . 25. . 26. . 27. . 28. .	1 2.				
4. 5. 5. . 7. . 8. 9. 10. . 711. . 12. . 13. . 14. . 15. . 16. . 17. . 18. . 19. . 20. . 21. . 22. . 23. . 24. . 25. . 26. . 27. . 28. .	_ 3.				
6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28.	4.				
7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 2122. 23. 24. 25. 26. 27. 28.					
8. 9. 10. 11. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 20. 21. -22. 23. 24. 25. 26. 27. 28. 28.			 -		
9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28.					
10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28.	8.			· · <u></u>	
11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. -22. 23. 24. 25. 26. 27. 28.					
12. 13. 14. 15. 16. 17. 18. 19. 20. 21. -22. 23. 24. 25. 26. 27. 28.					
13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28.	12.			 	
15. 16. 17. 18. 19. 20. 21. -22. 23. 24. 25. 26. 27. 28.	13.				
16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28.	14.				
17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28.	15.		-		
18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28.				· · · · · · · · · · · · · · · · · · ·	
19. 20. 21. 22. 23. 24. 25. 26. 27. 28.					
20. 21. 22. 23. 24. 25. 26. 27. 28.	T-18.				
21. 22. 23. 24. 25. 26. 27. 28.					
22. 23. 24. 25. 26. 27. 28.					
23. 24. 25. 26. 27. 28.	- 22.				
25. 26. 27. 28.	23.				
26. 27. 28.	24.				
27. 28.					
28.					
<u> </u>					
30.	- <u>4</u> 3.				

FORM I SV-TIC

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: COMPUCHEM Contract: OLM04-REVS SW01DPPB

SW-ID

SDG No.: RU1067

Matrix: (soil/water) WATER

SAS No.:

Lab Sample ID: RU1067-2

Lab Code: LIBRTY

Sample wt/vol:

1125 (g/mL) ML

Lab File ID: RU1067-2A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture:

decanted: (Y/N)___

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/23/02

Injection Volume:

2.0 (uL)

Case No.:

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 7.0

Extraction:

(Type) CONT

		CONCENTRATION UNITS:	
CAS NO.	COMPOUND	(ug/L or ug/Kg) <u>UG/L</u>	Q

	1		
100-52-7	Benzaldehyde	9 10	Ü
T 108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10-	Ŭ
108-60-1	2,2'-oxybis(1-Chloropropane)	10	Ü
98-86-2	Acetophenone	10	Ü
106-44-5	4-Methylphenol	1.0	Ū
621-64-7	N-Nitroso-di-n-propylamine	10	Ü
67-72-1	Hexachloroethane	10	Ü
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	10	Ü
105-67-9	2,4-Dimethylphenol	1.0	Ū
111-91-1	bis(2-Chloroethoxy)methane	10	Ü
120-83-2	2,4-Dichlorophenol	10	Ū
91-20-3	Naphthalene	10	Ū
106-47-8	4-Chloroaniline	10	Ū
87-68-3	Hexachlorobutadiene	1.0	Ū
105-60-2	Caprolactam	1.0	Ū
T 59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	1-0	U
77-47-4	Hexachlorocyclopentadiene	10	Ū
88-06-2	2,4,6-Trichlorophenol	V 10	U
95-95-4	2,4,5-Trichlorophenol	22 25	Ū
92-52-4	1,1'-Biphenyl	9 10	Ū
91-58-7	2-Chloronaphthalene	9 10	Ū
т 88-74-4	2-Nitroaniline	22 25	Ū
131-11-3	Dimethylphthalate	9 10	Ū
606-20-2	2,6-Dinitrotoluene	110	Ū
208-96-8	Acenaphthylene	1 10	U
99-09-2	3-Nitroaniline	22-25	U
83-32-9	Acenaphthene	9 10	Ū

FORM I SV-1

COE 11/12/02

1D SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

SDG No.: RU1067

Matrix: (soil/water) WATER

Lab Sample ID: RU1067-2

SAS No.:

Lab Code: LIBRTY

Sample wt/vol: 1125 (g/mL) ML

Case No.:

Lab File ID: RU1067-2A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture:

decanted: (Y/N)___

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/23/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

Extraction: (Type)

CONT

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

		1 A A B 1 T 1 A A A A A A A A A A A A A A A A A	· · · · · · · · · · · · · · · · · · ·	······································
_	51-28-5	2,4-Dinitrophenol	22 25	U
	100-02-7	4-Nitrophenol	22-25	Ü
1_	132-64-9	Dibenzofuran	910	U
1_	121-14-2	2,4-Dinitrotoluene	10	Ū .
	84-66-2	Diethylphthalate	10	<u>U</u>
¬	86-73-7	Fluorene	10	U
1	7005-72-3	4-Chlorophenyl-phenylether	₩1. 0	Ū
1	100-01-6	4-Nitroaniline	22 25	Ū
	534-52-1	4,6-Dinitro-2-methylphenol	22- 2 5	U
ヿ	86-30-6	N-nitrosodiphenylamine (1)	910	U
- [-	101-55-3	4-Bromophenyl-phenylether	110	U
,	118-74-1	Hexachlorobenzene	110	U
_	1912-24-9	Atrazine	10	U
7	87-86-5	Pentachlorophenol	22 25	Ū
-	85-01-8	Phenanthrene	4 10	U
	120-12-7	Anthracene	10	Ū
_	86-74-8	Carbazole	1-0	Ū
-1-	84-74-2	Di-n-butylphthalate	10	U
1-	206-44-0	Fluoranthene	10	U
	129-00-0	Pyrene	10	U
	85-68-7	Butylbenzylphthalate	1.0	Ū
-1-	91-94-1	3,3'-Dichlorobenzidine	1.0	U
1	56-55-3	Benzo (a) anthracene	10	Ū
_	218-01-9	Chrysene	10	U
Τ~	117-81-7	bis(2-Ethylhexyl)phthalate	10	Ū
-	117-84-0	Di-n-octylphthalate	10	U
· -	205-99-2	Benzo(b) fluoranthene	1.0	Ū
	207-08-9	Benzo(k)fluoranthene	10	Ū
	50-32-8	Benzo(a) pyrene	10	U
_	193-39-5	Indeno(1,2,3-cd)pyrene	10	Ū
_	53-70-3	Dibenzo (a, h) anthracene	10	U
	191-24-2	Benzo(g,h,i)perylene	¥ 10	- Ŭ
		annot be separated from Diphenylamine	10.6 / /	

(1) - Cannot be separated from Diphenylamine

CaE 11/18/08

FORM I SV-2

1G SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

SAS No.:

EPA SAMPLE NO.

SDG No.: RU1067

			SW01DPPB
<pre>- Lab Name:</pre>	COMPUCHEM	Contract: OLM04-REVS	

Matrix: (soil/water) WATER Lab Sample ID: RU1067-2

Case No.:

Lab Code: LIBRTY

Sample wt/vol: 1125 (g/mL) Lab File ID: RU1067-2A66 ML

Level: (low/med) LOW Date Received: 09/19/02

Date Extracted:09/20/02 % Moisture: ____ Decanted: (Y/N)___

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/23/02

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

pH: 7.0 Extraction: (Type) CONT GPC Cleanup: (Y/N) N

CONCENTRATION UNITS:

Number TICs found: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	**********	======	=========	===:
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27.				
28.				
29.				

FORM I SV-TIC

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW02PB Contract: OLM04-REVS

CAE 116/02 SDG No.: RU1067 Lab Code: LIBRTY Case No.: SAS No.:

- Matrix: (soil/water) WATER Lab Sample ID: RU1067-3

_ Lab Name: COMPUCHEM

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-3A66

- Level: (low/med) Date Received: 09/19/02 LOW

decanted: (Y/N)____ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/23/02

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N)pH: 7.0 Extraction: (Type) CONT

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

		(mg/2 01 mg/mg/ <u>o</u>	<u> </u>
100-52-7	Benzaldehyde	9 10	Ū
108-95-2	Phenol	. 10	U
111-44-4	bis(2-Chloroethyl)ether	140	Ū
95-57-8	2-Chlorophenol	10	Ū
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	1.0	Ū
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	Ū
- 67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	Ū
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	Ū
105-67-9	2,4-Dimethylphenol	10	Ū
111-91-1	bis(2-Chloroethoxy)methane	10	Ū
120-83-2	2,4-Dichlorophenol	1.0	Ū
91-20-3	Naphthalene	10	Ū
106-47-8	4-Chloroaniline	10	Ū
87-68-3	Hexachlorobutadiene	10	Ū
105-60-2	Caprolactam	10	Ū
- 59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	Ū
77-47-4	Hexachlorocyclopentadiene	1.0	Ü
88-06-2	2,4,6-Trichlorophenol	¥ ±0	U
95-95-4	2,4,5-Trichlorophenol	23 25	Ū
92-52-4	1,1'-Biphenyl	9 10	Ū
91-58-7	2-Chloronaphthalene	910	U
88-74-4	2-Nitroaniline	23 25	Ū
131-11-3	Dimethylphthalate	9 10	Ü
606-20-2	2,6-Dinitrotoluene	110	U
208-96-8	Acenaphthylene	V 10	Ū
99-09-2	3-Nitroaniline	2325	Ü
83-32-9	Acenaphthene	9 10	Ū
	FORM I SV-1	Car Illizor	OLM04.

1D SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Contract: OLM04-REVS SW02PB

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

_ Lab Name: COMPUCHEM

- Matrix: (soil/water) WATER Lab Sample ID: RU1067-3

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-3A66

- Level: (low/med) LOW Date Received: 09/19/02

% Moisture: decanted: (Y/N) Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CONCENTRATION UNITS:
- CAS NO. COMPOUND (ug/L or ug/Kg) <u>UG/L</u> (

, <u> </u>	I 2 4 Dinibuonbonol	1005	77
51-28-5	2,4-Dinitrophenol	23 25	U
100-02-7	4-Nitrophenol	23-25	Ū
132-64-9	Dibenzofuran	9 10	U
121-14-2	2,4-Dinitrotoluene	10-	U
84-66-2	Diethylphthalate	10	Ü
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenylether	₩ 10	U
100-01-6	4-Nitroaniline	23 25	U
534-52-1	4,6-Dinitro-2-methylphenol	23 2 5	Ü
– 86-30-6	N-nitrosodiphenylamine (1)	910	Ŭ
101-55-3	4-Bromophenyl-phenylether	110	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	₩ 10	U
87-86-5	Pentachlorophenol	23 25	Ū
85-01-8	Phenanthrene	9 20	Ū
120-12-7	Anthracene	, 10	Ū
86-74-8	Carbazole	(10	Ū
84-74-2	Di-n-butylphthalate	1.0	Ū
206-44-0	Fluoranthene	10	Ū
129-00-0	Pyrene	1.0	U
_ 85-68-7	Butylbenzylphthalate	10	Ū
91-94-1	3,3'-Dichlorobenzidine	10	Ū
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
- 117-81-7	bis(2-Ethylhexyl)phthalate	1 10	Ū
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	1 10	U
207-08-9	Benzo(k) fluoranthene	10	Ū
50-32-8	Benzo(a)pyrene	110	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a, h) anthracene	10	U
_ 191-24-2	Benzo(g,h,i)perylene	¥ 10	Ū
	annot be congrated from Dinhenylamine	006 1 1 1	

(1) - Cannot be separated from Diphenylamine

CaE 11/12/08

FORM I SV-2

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

- Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

SDG No.: RU1067

EPA SAMPLE NO.

- Matrix: (soil/water) WATER

Lab Sample ID: RU1067-3

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-3A66

Level: (low/med)

LOW

Date Received: 09/19/02

% Moisture: ____ Decanted: (Y/N)___

Date Extracted: 09/20/02

Concentrated Extract Volume:

1000 (uL)

Date Analyzed: 09/23/02

Injection Volume:

2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

Extraction: (Type) CONT

Number TICs found: 0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	************************************	=======		=====
2.				
Т_3.				
4.				
5.				
6.				
$\begin{bmatrix} \frac{7}{8} \end{bmatrix}$				
9.				
10.				
111.				
12.				
13.				
т 14.				
15.				
16.				
17.				
18.				
19. 20.				
21.				
22.		····		
23.				
24.				
_ 25.				
26.				
27.				
28.				
- 29.				
30.				

FORM I SV-TIC

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW03PB SW-6

- Lab Name: COMPUCHEM

Contract: OLM04-REVS

Lab Code: LIBRTY Case No.:

SAS No.:

COE 11/0/01/ SDG No.: RU1067

Matrix: (soil/water) WATER

Lab Sample ID: RU1067-4

Sample wt/vol: 1100 (g/mL) ML

Lab File ID: RU1067-4A66

Level: (low/med) LOW

Date Received: 09/19/02

% Moisture: decanted: (Y/N)

Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 09/23/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Extraction: (Type) CONT

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

100-52-7 Benzaldehyde 9 10 108-95-2 Phenol 10 111-44-4 bis(2-Chloroethyl)ether 10 U 95-57-8 2-Chlorophenol 10 IJ 95-48-7 2-Methylphenol 10 IJ 2,2'-oxybis(1-Chloropropane) 10 108-60-1 10 98-86-2 Acetophenone U 4-Methylphenol 106-44-5 10 U N-Nitroso-di-n-propylamine 621-64-7 10 IJ 67-72-1 Hexachloroethane 10 98-95-3 Nitrobenzene 10 78-59-1 Isophorone 10 88-75-5 2-Nitrophenol 10 2,4-Dimethylphenol 105-67-9 10 Ū bis (2-Chloroethoxy) methane 111-91-1 10 Ū 120-83-2 2,4-Dichlorophenol 10 Ū 91-20-3 Naphthalene 10 Ū 106-47-8 4-Chloroaniline 10 87-68-3 Hexachlorobutadiene 10 IJ 105-60-2 10 Caprolactam 59-50-7 4-Chloro-3-methylphenol 10 Ū 2-Methylnaphthalene 91-57-6 10 Ū Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 77-47-4 $\frac{10}{10}$ V 10 88-06-2 2,4,5-Trichlorophenol 95-95-4 23 25 92-52-4 9 10 910 Ū 91-58-7 2-Chloronaphthalene Ū 88-74-4 2-Nitroaniline 2325 Ū 9 10 131-11-3 Dimethylphthalate 606-20-2 2,6-Dinitrotoluene 10 J 10 208-96-8 Acenaphthylene 99-09-2 3-Nitroaniline 2325 83-32-9 Acenaphthene 9 10 CREUINOY

FORM I SV-1

1D SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Contract: OLM04-REVS SW03PB

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-4

- Lab Name: COMPUCHEM

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-4A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: decanted: (Y/N) Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

		_	
51-28-5	2,4-Dinitrophenol	23 25	Ū
100-02-7	4-Nitrophenol	23-25	Ū
132-64-9	Dibenzofuran	9 10	Ū
121-14-2	2,4-Dinitrotoluene	1.0	Ū
84-66-2	Diethylphthalate	10	U ,
86-73-7	Fluorene	10	Ū
7005-72-3	4-Chlorophenyl-phenylether	10	Ū
100-01-6	4-Nitroaniline	23 25	Ū
534-52-1	4,6-Dinitro-2-methylphenol	23 25	Ū
86-30-6	N-nitrosodiphenylamine (1)	g 10	Ū
101-55-3	4-Bromophenyl-phenylether	, 10	Ū
118-74-1	Hexachlorobenzene	10	Ū
1912-24-9	Atrazine	√10	U
87-86-5	Pentachlorophenol	23 25	U
85-01-8	Phenanthrene	9 10	U
120-12-7	Anthracene	110	Ū
86-74-8	Carbazole	10	Ū
84-74-2	Di-n-butylphthalate	10	Ū
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	Ū
91-94-1	3,3'-Dichlorobenzidine	10	Ü
56-55-3	Benzo(a)anthracene	10	Ū
218-01-9	Chrysene	10	Ū
117-81-7	bis(2-Ethylhexyl)phthalate	1.0	U
117-84-0	Di-n-octylphthalate	10	Ū
205-99-2	Benzo(b) fluoranthene	10	U
207-08-9	Benzo(k) fluoranthene	10	U
50-32-8	Benzo(a) pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a, h) anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
$(1) - C_2$	annot be separated from Diphenylamine	MG 11	

(1) - Cannot be separated from Diphenylamine

(aE11/12/02

FORM I SV-2

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

SAS No.:

EPA SAMPLE NO.

SDG No.: RU1067

				SW03PB
- Lab Name:	COMPUCHEM	Contract:	OLM04-REVS	

- Matrix: (soil/water) WATER Lab Sample ID: RU1067-4

Case No.:

Lab Code: LIBRTY

Sample wt/vol: 1100 Lab File ID: RU1067-4A66 (g/mL) ML

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: ____ Decanted: (Y/N) Date Extracted:09/20/02

Concentrated Extract Volume: Date Analyzed: 09/23/02 1000 (uL)

Dilution Factor: 1.0 Injection Volume: 2.0(uL)

GPC Cleanup: (Y/N) N Extraction: (Type) CONT pH: 7.0

CONCENTRATION UNITS: Number TICs found: (ug/L or ug/Kg) UG/L

T CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=======================================	=======================================	±======	========	=====
1.				
T 3.	·			
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.			•	
13.				
- 14.			- · · · - · · · · · · · · · · · · · · · · · · ·	
15.	<u> </u>			
15. 16.				
17.				
7 18.				
19.				
20.				
21.	<u> </u>			
22.				
24.				
7 <u>26.</u>				
27.			<u> </u>	
28.				
7 29.				
30.				

FORM I SV-TIC

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Page 1		
		
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DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

WET CHEMISTRY ANALYSIS DATA Total Suspended Solids, Chloride, and Ammonia-Nitrogen in Water

Sample Delivery Group Nos. RU1067 and RW1067 September 2002 Sample Collections

Chemical Analyses Performed by:

CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, TN 37922
(865) 966-8880

November 12, 2002



EXECUTIVE SUMMARY

Validation of the wet chemistry analysis data (total suspended solids [TSS], ammonia-nitrogen [ammonia], and chloride) prepared by CompuChem Environmental for 14 water samples and one field blank from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were issued by the laboratory in two separate data packages, under Sample Delivery Group (SDG) Nos. RU1067 and RW1067, which were received for review on October 4, 2002, with additional information provided on October 31 and November 6 and 11, 2002. The following field samples were reported:

SDG No. RW1067: GW08PB (MB-1) GW03PB (MB-5) GW06PB (MB-8) GW09FBPB (Field Blank)	GW08DPPB (MB-1D) GW04PB (MB-6) GW02PB (MB-9)	GW07PB (MB-2) GW05PB (MB-7) GW01PB (MB-10)
SDG No. RU1067: PW01PB (PW-1) SW02PB (SW-5)	SW01PB (SW-1) SW03PB (SW-6)	SW01DPPB (SW-1D)

Based on the validation effort, the sample results were qualified or corrected as follows:

- Results for ammonia in SW01PB and SW01DPPB were rejected (R).
- The positive results for ammonia in GW07PB, GW03PB, GW04PB, GW05PB, GW06PB, and GW02PB were rounded to reflect two significant figures.
- The positive results for TSS in GW08PB, GW08DPPB, PW01PB, SW01PB, SW01DPPB, and SW03PB were rounded to reflect two significant figures.
- Reporting Limits for ammonia, chloride, and TSS were adjusted to reflect two significant figures.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section X). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section IX.

This validation report should be considered <u>part of both data packages</u> for all future distributions of the wet chemistry data.



INTRODUCTION

Analyses for the requested parameters were performed by the laboratory according to the following analytical methods:

Ammonia - EPA 350.1 Chloride - EPA 300.0 Total Suspended Solids (TSS) - EPA 160.2

These methods are found in "Methods for Chemical Analysis of Water and Wastes," EPA 600/4-79/020, Rev. 3/83.

Since no validation guidelines specific to the analytical methods used are available, the validation was based on the requirements of the referenced procedures, the specifications of the project-specific Quality Assurance Project Plan (QAPP) and best professional judgment. The validation approach was similar to that described in USEPA's "National Functional Guidelines for Inorganic Data Review" (EPA-540/R-94/013, February 1994).

The data validation process is intended to evaluate data on a technical basis rather than a contract or method compliance basis. An initial assumption is that each data package contains sufficient raw data documentation to facilitate the validation process, comparable to the level of documentation required in a Contract Laboratory Program (CLP) data package.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the findings of this review, qualifier codes may be added by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with EPA's validation guidelines:

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- R The data are unusable. (Note: Analyte may or may not be present.)
- J The associated value is an estimated quantity.
- UJ The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables in Attachment A and the Classical Chemistry Analyses Data Sheets (Form Is) in Attachment B to qualify the results as appropriate according to the review of the data packages.



Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The samples were collected 9/17-18/02. Analyses for all parameters were conducted within the holding times specified by the referenced methods and the QAPP (28 days from collection for chloride and ammonia; seven days from collection for TSS).

Physical preservation of all samples with ice was documented by the sampler on both applicable chain of custody (COC) records, and acceptable cooler temperatures (4.0-6.0°C; QC 4°C ±2°C) on laboratory receipt were also documented on each of the COCs.

Chemical preservation of the samples for ammonia analysis with sulfuric acid was also clearly documented on the COC records. However, no pHs were recorded by the laboratory on the COCs and no pH values were entered in the pH column on either of the laboratory's receiving logs. At the request of the validator, the laboratory provided corrected receiving logs via facsimile on 10/31/02. The corrected receiving log for SDG No. RU1067 showed pHs of <2 for all samples intended for ammonia analysis and was, therefore, acceptable. However, the "corrected" receiving log for SDG No. RW1067 indicated pHs of ">9" for all of the samples intended for ammonia analysis. This is incorrect. In response to the validator's second request, the laboratory provided a properly corrected receiving log for SDG No RW1067 via UPS on 11/11/02; this record appropriately showed pHs <2 for all samples intended for ammonia analysis, and no further action was necessary.

II. Calibrations

All samples were analyzed for chloride on 9/25-26/02. An initial calibration incorporating a blank and six standards at concentrations ranging from 0.1 mg/L to 50 mg/L was performed on 9/18/02 and documented in the data package. The reported correlation coefficient for the linear regression describing the best-fit curve was acceptable (>0.995) but could not be reproduced exactly by the validator, likely due to the weighting factor used by the laboratory. No action was necessary on this basis. ICV/CCV standards were run at appropriate frequencies during both chloride analysis series and all showed acceptable (QC 85-115%) recoveries relative to reported true values (94.7-106%).

The samples were analyzed for ammonia on 9/27/02; two calibration curves, each incorporating a blank and seven standards at concentrations ranging from 0.1 mg/L to 8 mg/L, were documented for this date. The reported correlation coefficient for the linear regression describing the best-fit curve for each IC was acceptable (>0.995) and was verified by the validator. ICV/CCV standards were run at appropriate frequencies during both ammonia analysis series and showed acceptable (QC 85-115%) recoveries relative to reported true values (101-110%). However, since only final results are displayed in the raw data documentation (i.e., absorbance values are not provided), these results cannot be verified by the validator.



Calibration is not applicable to the weight measurements used to determine TSS.

III. Blanks

No contamination was reported in any of the method blanks associated with the sample analyses; these results are supported by the raw data available in the data packages.

A field blank (GW09FBPB) was submitted for analysis with this set of site samples. No target analytes were detected in the field blank.

IV. Laboratory Control Samples

Laboratory control samples prepared and analyzed with the samples for all three analysis parameters showed acceptable recoveries (Lab QC 85-115%), ranging from 97.2-110%.

V. Laboratory Duplicate Analysis

No laboratory duplicate analyses were performed for any of the wet chemistry analysis parameters on any of the samples in this data set.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD analyses were performed on sample SW01PB for ammonia and chloride. Recoveries for ammonia (108% and 101%) and chloride (104% and 104%) were acceptable and showed excellent reproducibility, with RPDs of 6.5% and 0.4%, respectively (QC 80-120% Recovery and \leq 20 RPD).

It must be noted that the responses for chloride in both spiked sample analyses exceeded the upper limit of the established calibration range. No dilutions were performed by the laboratory. Since both responses were less than 15% above the concentration of the highest calibration standard, no action was taken by the validator on this basis. However, the laboratory should be requested to appropriately dilute and re-analyze all samples that fall outside the established calibration range.

Although requested on the COC records, no MS/MSD analyses were performed on sample GW08PB for any of the wet chemistry analysis parameters. According to the laboratory, this was due to a scheduling error (see Attachment C).



VII. Field Duplicates

Samples GW08PB and GW08DPPB were identified as a field duplicate pair. Positive paired results showed acceptable reproducibility (QAPP QC \leq 25 RPD) for chloride (1.5 RPD) and TSS (23 RPD). Ammonia was not detected above the RL in either sample analysis, therefore no quantitative evaluation of precision could be made for this parameter using these data.

Samples SW01PB and SW01DPPB were also identified as a field duplicate pair. Positive paired results showed good reproducibility for chloride (4.9 RPD) and TSS (19 RPD). Ammonia was not detected above the RL in SW01PB (0.10 U) but was found at 0.24 mg/L in SW01DPPB. Results for ammonia in SW01PB and SW01DPPB were rejected (R) as unreliable on this basis.

VIII. Sample Results Verification

Results for TSS and chloride were correctly calculated and accurately reported for the samples in this data set based on review of the available raw data. Ammonia results were correctly transcribed from the raw data; since only direct readings of the final results were documented, no verification of the reported concentrations could be made by the validator.

Sample results and RLs were reported to inconsistent significant figures and are not in accordance with previously-defined CompuChem policy, which states that values greater than 10 are reported to three significant figures and values less than 10 are reported to two significant figures. For consistency with historical data generated in support of this project, all results greater than or equal to 10 mg/L were adjusted to reflect three significant figures and values less than 10 mg/L (including RLs) were adjusted to reflect two significant figures, where necessary. Specifically, the following actions were taken:

- The positive results for ammonia in GW07PB, GW03PB, GW04PB, GW05PB, GW06PB, GW02PB, and SW01DPPB were rounded to reflect two significant figures because each value is less than 10 mg/L and was reported to three significant figures by the laboratory.
- The positive results for TSS in GW08PB, GW08DPPB, PW01PB, SW01PB, SW01DPPB, and SW03PB were rounded to reflect two significant figures because these values are less than 10 mg/L and were reported to three significant figures by the laboratory.
- RLs for ammonia, chloride, and TSS were adjusted to reflect two significant figures (instead of three, as reported by the laboratory).



The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation effort.

IX. Documentation

Two chain of custody (COC) records were present in both data packages and included all reported samples. The following issues were noted:

- Sample PW01PB was not recorded by the sampler on either of the COCs. An appropriate notation to this effect was made by the laboratory on COC #061476.
- A second, facsimile copy of COC #061476 was also included in both data packages. The facsimile was signed by the same person and showed the same date/time of laboratory receipt as the "original." However, the two signatures are not identical and the facsimile does not contain two laboratory notations regarding sample condition on laboratory receipt that are on the "original." No explanation for this additional copy of one of the COC records was provided by the laboratory.
- Despite a specific request on the COCs, sample pHs on laboratory receipt were not recorded on either of the COCs.
- Copies of courier airbills were not included in either data package to document the shipment portion of the sample transfers. Airbill numbers, however, were documented on both of the COC records.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

The laboratory receiving logs in the data packages received for review did not include sample pH values measured on receipt at the laboratory. At the validator's request, corrected receiving logs were provided via facsimile by the laboratory on 10/31/02. However, the pHs recorded for the ammonia samples on the receiving log for SDG No. RW1067 (>9) were incorrect. The laboratory was contacted a second time, and a properly corrected receiving log for RW1067 was received via UPS on 11/11/02. The properly corrected documents were inserted into the data package for SDG #RU1067 as pages 109 and 110 and into the data package for SDG #RW1067 as pages 95 and 95A by the validator.



For ammonia, absorbance readings were provided for the IC standards but only direct readings of the final results were documented in the raw data for all runs performed during the sample analysis series. Therefore, no verification of the concentrations reported for these analyses could not be verified by the validator. At the discretion of the data user, the laboratory may be requested to provide this documentation in future data packages prepared in support of this project.

The true values for chloride in the ion chromatography ICV/CCV standards and for ammonia in the ICV standard were not documented in the data package. These values were provided by the laboratory via facsimile on 10/28/02 in conjunction with a comparable request related to validation of unrelated data for the same parameters (see Attachment C), and the same values were used to evaluate the data in these data packages.

The sample results on the spike and spike duplicate summary forms were inconsistently reported from the raw data. Specifically, on both forms, the unspiked sample result was corrected for the 5-fold dilution but the spiked sample result was not. At the request of the validator, the laboratory provided corrected summary forms, which were inserted into the data package for SDG No. RU1067 by the validator, replacing pages 8-10.

A corrected run log for the 9/26/02 ion chromatography analysis series for chloride was provided by the laboratory via facsimile on 11/6/02. This log was corrected to accurately reflect the dilution factors for each analysis relevant to this data set. The corrected page was inserted into the data package for SDG No. RW1067 by the validator, replacing the originally-provided page 26.

Most of these documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

X. Overall Assessment

Sample results for the three wet chemistry parameters were qualified or corrected as follows based on the validation effort:

- Results for ammonia in SW01PB and SW01DPPB were rejected (R) as unreliable due to lack of confirmation in the field duplicate analyses.
- The positive results for ammonia in GW07PB, GW03PB, GW04PB, GW05PB, GW06PB, GW02PB, and SW01DPPB were rounded to reflect two significant figures because each value is less than 10 mg/L and was reported to three significant figures by the laboratory.



- The positive results for TSS in GW08PB, GW08DPPB, PW01PB, SW01PB, SW01DPPB, and SW03PB were rounded to reflect two significant figures because these values are less than 10 mg/L and were reported to three significant figures by the laboratory.
- RLs for ammonia, chloride, and TSS were adjusted to reflect two significant figures (instead of three, as reported by the laboratory).

Documentation issues are discussed in Section IX.

This validation report should be considered <u>part of both data packages</u> for all future distributions of the wet chemistry data.



ATTACHMENT A

DATA TABLES

Wet Chemistry - SDG Nos. RU1067 and RW1067 September 2002 Sample Collections - Marion Bragg Landfill

Marion Bragg Landfill - September 2002 - Wet Chemistry Parameters in GW and SW

Results are in mg/L

Collection Point		MB-1	MB-1D	MB-2	MB-5	MB-6	MB-7	MB-8	MB-9
Sample ID		GW08PB	GW08DPPB	GW07PB	GW03PB	GW04PB	GW05PB	GW06PB	GW02PB
Lab Sample No.		RW1067-8	RW1067-9	RW1067-7	RW1067-3	RW1067-4	RW1067-5	RW1067-6	RW1067-2
Collection Date		9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02
Ammonia Chloride Total Suspended Solids	0.10	0.10 U	0.10 U	7.3	4.1	3.8	6.8	5.3	0.52
	4.0	20.6	20.3	18.9	16.7	13.2	23.6	27.3	12.0
	1.0	7.8	6.2	12.4	16.6	22.6	31.2	44.8	52.8

Marion Bragg Landfill - September 2002 - Wet Chemistry Parameters in GW and SW

Results are in mg/L								
Collection Poin Sample IC Lab Sample No Collection Dat)	MB-10 GW01PB RW1067-1 9/18/02	Field Blank GW09FBPB RW1067-10 9/18/02	PW-1 PW01PB RU1067-5 9/17/02	SW-1 SW01PB RU1067-1 9/17/02	SW-1D SW01DPPB RU1067-2 9/17/02	SW-5 SW02PB RU1067-3 9/17/02	SW-6 SW03PB RU1067-4 9/17/02
Ammonia Chloride	0.10	0.10 U 23.0	0.10 U 2.0 U	0.10 U 21.4	R 75.1	R 78.5	0.10 U 79.3	0.10 U 41.7
Total Suspended Solids	1.0	70.2	1.0 U	9.6	9.9	8.2	13.6	1.0



ATTACHMENT B

CLASSICAL CHEMISTRY ANALYSES DATA SHEETS (FORM Is)

Wet Chemistry - SDG Nos. RU1067 and RW1067 September 2002 Sample Collections - Marion Bragg Landfill

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

ab Name: CompuChem Lab Code: LIBRTY	Case	Contract: M	ARION BRAGG MB-1 GW08PB CAE 11/7/02 NRAS No.:			
3DG No.: RW1067				•		
Matrix (soil/water):	WATER		La	b Sam	ple II	D: RW1067-8
Date Received: 9/19/	/02		.8	Solid	s: 0.	.00
·	entration Units (mg/	L or mg/kg dry	weight	t):	mg/	/L
·	entration Units (mg/	L or mg/kg dry	weight C	t):	mg/	/L DATE ANALYZED
Conce	entration Units (mg/		С			DATE
Conce	entration Units (mg/	CONCENTRATION	С			DATE ANALYZED

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

ab Name:	CompuChem			ARION	BRAGG	<u> </u>	MB-ID GW08DPPB		
Tab Code:	LIBRTY			NR			CAE 11/7/02 PAS No.:		
TOG No.:	RW1067								
matrix (so	oil/water):	WATER		La	ab Sam	ple I	D: RW1067-9		
ate Recei	ved: 9/19/0	2		*	Solid	ls: 0	.00		
_	Concen	tration Un:	its (mg/L or mg/kg dry	weigh	t):	mg.	/L		
	PARAMETI	er -	CONCENTRATION	С	Q	м	DATE ANALYZED		
_	TSS		1 6.2 6.20	1			9/23/02		
	Chloride	9	20.3				9/26/02		
	Ammonia		0.10 0.100	- U			9/27/02		

CQ E 1/8/02

SW-846

Comments:

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

9/27/02

ab Name:	CompuChem		Contract: MARION BRAGG					W07PB	
Lab Code:	LIBRTY	Case N	Case No.:			NRA	NRAS NO.: 11/7/02		
OG No.:	RW1067				-				
Matrix (so	oil/water): WAT	ER		La	b Sam	ple I	D: RW1067	-7	
ate Recei	ved: 9/19/02	_		8	Solid	s: 0	. 00		
_	Concentrati	on Units (mg/L	or mg/kg dry	y weigh	t):	mg,	/L		
_	PARAMETER	co	ONCENTRATION	С	Q	м	DATE ANALYZEI	,	
	Chloride		18.	9			9/26/02		
	TSS		12.4	4			9/23/02		

CAE 11/8/02

Ammonia

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

b Name:	CompuChem		Contract: MA	RION	BRAGG		MB-5	03PB	
ab Code:	LIBRTY	Cas	se No.:	NRAS NO.: 11/7/02					
G No.:	RW1067								
Tatrix (soi	.l/water):	WATER		La	b Sam	ple I	D: RW1067-	3	
te Receiv	ed: 9/19/0	2		*	Solid	s: <u>0</u>	. 00		
~	Concen	tration Units (mo	g/L or mg/kg dry	weigh	t):	mg,	/L		
-	PARAMETE	ER	CONCENTRATION	С	Ω	м	DATE ANALYZED]	
	Chloride)	16.7]			9/26/02	Ĵ	
	TSS		16.6]			9/23/02		
-	Ammonia		4.1 4.10		I		9/27/02	- I	

Cae 11/102

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

ம் Name:	CompuChem		Contract: M		MB-6			
Lab Code:	LIBRTY	Case	Case No.:		NRAS NO.:			
)G No.:	RW1067							
matrix (soi	1/water): W	ATER		La	b Sam	ple I	D: RW1067-4	
ıte Receiv	ed: 9/19/02			8	Solid	s: 0	. 00	
_	Concentra	tion Units (mg,	L or mg/kg dry	weigh	t):	mg,	/L	
	PARAMETER		CONCENTRATION	С	Q	м	DATE ANALYZED	
	Chloride		13.2				9/26/02	
	TSS		22.6	l			9/23/02	
	Ammonia		3,8 3.78	1			9/27/02	

CAE 11/7/02

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

DDA	CALOTE	370
LPM	SAMPLE	NU.

ib Name:	CompuChem	Contract: MA	Contract: MARION BRAGG				
Lab Code:	LIBRTY	Case No.:	NRAS NO.:				
TOG No.:	RW1067						
matrix (so	il/water): WATER		Lal	b Sama	ple I	D: RW1067-5	
ate Recei	ved: 9/19/02		8 3	Solid	s: 0	. 00	
	Concentration Un	its (mg/L or mg/kg dry)	weight	:):	mg,	/L	
	PARAMETER	CONCENTRATION	С	Q	м	DATE ANALYZED	
	Chloride	23.6	9/26/02			9/26/02	
	TSS	31.2				9/23/02	
_	Ammonia	6.8 6.79				9/27/02	

CAE 11/8/08

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

9/26/02

9/23/02

9/27/02

					1		
ab Name: 9	CompuChem	Contract: M	RION	BRAGG		MB-8 GWO	
Tab Code: 1	LIBRTY	Case No.:	NF			RAS NO.: 117102	
DG No.:	RW1067						
Matrix (soi:	l/water): WATER	····	La	b Sam	ple I	D: RW1067-6	
ate Receive	ed: 9/19/02		8	Solid	s: 0	. 00	
	Concentration U	nits (mg/L or mg/kg dry	weight	t):	mg,	/L	
	PARAMETER	CONCENTRATION	С	Q	м	DATE ANALYZED	

Chloride

Ammonia

TSS

5.3 5.33 | CAE 11/7/02

27.3

44.8

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

_								
o Name: C	ompuChem	Contract: MA	RION	BRAGG		MB-9)2PB	
ab Code: L	IBRTY	Case No.:			NRA	NRAS NO.:		
3 No.: R	W1067							
atrix (soil	/water): WATER		La	b Sam	ple I	D: RW1067-2	2	
te Receive	d: 9/19/02		₽.	Solid	s: 0_	. 00		
_	Concentration U	nits (mg/L or mg/kg dry	weight	t):	mg	/L	· .	
_	PARAMETER	CONCENTRATION	С	Ω	м	DATE ANALYZED]	
	Chloride	12.0	2.0			9/26/02]	
	TSS	52.8				9/23/02]	
	Ammonia	0.52 0.525	1	I		9/27/02	7	

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CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO

_						SIII OIKII BIS I	
b Name: C	CompuChem	Contract: MA	RION I	BRAGG		GW01PB MB-IO	
_	LIBRTY	Case No.:	N			RAS NO.:	
G No.: B	RW1067						
Matrix (soil	L/water): WATER		La	b Sam	ple I	D: RW1067-1	
te Receive	ed: 9/19/02		*	Solid	ls: 0	.00	
_	Concentration \	Units (mg/L or mg/kg dry	weight	t):	<u>mg</u>	/L	
_	PARAMETER	CONCENTRATION	С	Q	м	DATE ANALYZED	
	Chloride	23.0				9/26/02	
ľ.	TSS	70.2				9/23/02	
_	Ammonia	0.10 0.100	บ			9/27/02	

COE 11/7/02

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

			GW09FBPB
ab Name: Co	mpuChem	Contract: MA	PTON BRACC Held Blank
Lab Code: LI	BRTY	Case No.:	NRAS NO.: 17/02
OG No.: RW	1067	_	
Matrix (soil/	water): WATER		Lab Sample ID: RW1067-10
ate Received	: 9/19/02		% Solids: 0.00
-	Concentration Uni	ts (mg/L or mg/kg dry v	weight): mg/L
			DATE

PARAMETER	CONCENTRATION	С	Ω	м	DATE ANALYZED
TSS	/.O 1.00	U			9/23/02
Chloride	2.0 2.00	U			9/26/02
Ammonia	0.10 0.100	Ü			9/27/02

Cat 1/8/02

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

- .			10202			EPA SAMPLE	NO.
S. 37	a					PW-I PW01PE	3
	CompuChem	Contract: _			'	Cae 11/7/02	
ಸಾ b Code:		Case No.:			NRA	AS No.:	
יים No.:	RU1067						
⊶trix (so	oil/water): WATER		La	b Sam	ple I	D: RU1067-5	
`nte Recei	.ved: 9/19/02		*	Solid	s: 0	.00	
_	Concentration U	Jnits (mg/L or mg/kg dry	weigh	t):	mg,	/L	
		<u> </u>	T		Γ =	DATE	
_	PARAMETER	CONCENTRATION	С	Q	М	ANALYZED	
_	TSS	1 9.6 0.60				9/23/02	
	Chloride	21.4		<u> </u>	<u> </u>	9/25/02	
_	Ammonia	0.10 0.100	U	<u> </u>	L	9/27/02	
		CaE 11/8/02					
							
_							
_							
_							
- Comments	3: 					···	
							
		 				00	0 2
							<u> </u>

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CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

b Name:	CompuChem	Contract:				SW-1 SW01PB					
ab Code:	LIBRTY	Case	No.:	NRAS NO. : 11 7/02							
G No.: RU1067											
latrix (so	il/water): W	ATER		La	b Sam	ple II	D: RU1067-1	l .			
ıte Recei	ved: 9/19/02	· 		*	Solid	s: 0.	. 00				
~	Concentra	tion Units (mg/	L or mg/kg dry	weight	:):	mg/	/L				
							DATE	7			
-	PARAMETER		CONCENTRATION	င	Ω	М	ANALYZED	j			
•	Ammonia		R 0.100	 U			9/27/02]			
	Chloride		75.1				9/25/02]			
-	TSS		9.9 9.90				9/23/02	7			

CAE 11/8/0~

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

-					_	EPA SAM	PLE NO.
ab Name: Co	ompuChem	Contract:				SW-ID	
ab Code: LI	BRTY	Case No.:			NRA	S No.: 11/7/02	
DG No.: RU	1067						
	(La	b Sam	ple I	D: <u>RU1067-2</u>	
atrix (soil/	water): WATER						
				Solid	s: 0	.00	
	1: 9/19/02	its (mg/L or mg/kg dry	8		s: 0		
	1: 9/19/02	its (mg/L or mg/kg dry CONCENTRATION	8				
	Concentration Uni		weight	E) :	mg,	/L DATE	
atrix (soil/ ate Received	Concentration Uni	CONCENTRATION	weight	E) :	mg,	/L DATE ANALYZED	

Comments:	
	()()3

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: CompuCh	3m	Contract:			[SW-5 SWO S No.: 11710
Code: LIBRTY		Case No.:			NRA	s No.: 11 +10
No.: RU1067						
rix (soil/water	: WATER		La	b Sam	ple II	D: RU1067-3
ce Received: 9/	19/02		8	Solid	s: 0.	.00
_		ts (mg/L or mg/kg dry			mg/	′L
Con		ts (mg/L or mg/kg dry CONCENTRATION			_	
Con	centration Uni		weight C	t):	mg/	L DATE ANALYZED
Con	METER	CONCENTRATION	weight C	t):	mg/	/L DATE

- Comments:

1-CC

	CLASSICAI	CHEMISTRY ANALY	SES D	ATA S	HEET	EPA SAMPI	E NO
_					ł	SW03P	
. o Name:	CompuChem	Contract:			<u> </u>	5W-6	В
ano Code:	LIBRTY	Case No.:			NRA	LS NO. : 117/02	
mg No.:	RU1067						
-trix (so	il/water): WATER		La	b Sam	ple I	D: RU1067-4	
:-te Recei	ved: 9/19/02		8	Solid	s: 0	. 00	
_	Concentration Units	(mg/L or mg/kg dry v	veight	:):	mg,	/L	
	PARAMETER	CONCENTRATION	С	Q	м	DATE ANALYZED	
_	TSS	1.0 1.00				9/23/02	
	Chloride	41.7				9/25/02	
	Ammonia	0.10 0.100			L	9/27/02	
		cae ilslos					
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_							
-							

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ATTACHMENT C

DATA ISSUES: VALIDATOR QUESTIONS AND LABORATORY RESPONSES CHLORIDE AND AMMONIA TRUE VALUES, AS PROVIDED FOR SDG #N1053

Wet Chemistry - SDG Nos. RU1067 and RW1067 September 2002 Sample Collections - Marion Bragg Landfill

Re: RU1067 & RW1067 inquiry

- 1. Yes, the GW samples were also diluted by a factor of five. An amended copy of the run log is included.
- 2. It is correct that the %Rs for the chloride are based on the uncorrected sample results. There has been some differences between analysts as to the procedure used for doing the QC. The proper way should be to spike and then dilute. All analysts running this method have recently been instructed as to the proper method and this error should not occur in the future. Corrected forms have been provided.
- 3. The duplicate forms were reported with the incorrect dilution-corrected values. The corrected forms are provided.
- 4. The QC was not analyzed on GW08 due to a laboratory scheduling error. The laboratory error was in not scheduling the QC as required, therefore the analysts did not know to run the QC as required.

Carol Erikson

From:

"Carol Erikson" <cerikson@trilliuminc.com>

To:

"Rodney Raimonde" < rraimonde@compuchemlabs.com>

Sent: Subject: Thursday, October 31, 2002 10:18 AM Marion Bragg - RU1067/RW1067

Rodney -

In the chloride data:

Only the "SW-" and "PW-" samples are noted in the run log as having been run at 5-fold dilutions. Please confirm that the "GW-" samples were similarly diluted.

The values on the MS/MSD summary forms are inconsistently reported from the raw data ... the unspiked sample result is corrected for the 5-fold dilution on both forms, but the spiked sample result is not. The reported %Rs are based on 40 mg/L spike added and the uncorrected (i.e., as measured) sample concentrations. This is different from how the chloride spikes worked in the LDI data package (#N1053), where the 40 mg/L spike added amount was compared to the dilution-corrected sample concentrations. Please explain, and provide corrected summary forms as appropriate.

The values on the DUP summary form are also inconsistently reported - one value is dilution-corrected, the other is not. Please provide a corrected summary form.

In general for the wet chemistry parameters ... why was GW08 not run as a spike and spike duplicate?

Thanks.

Carol Erikson
Trillium, Inc.
cerikson@trilliuminc.com
865/966-8880
865/966-8885 fax

Carol Erikson

From:

"Carol Erikson" <cerikson@trilliuminc.com>

To:

"Rodney Raimonde" < rraimonde@compuchemlabs.com>

Sent: Subject: Thursday, October 31, 2002 9:15 AM Marion Bragg - RU1067 and RW1067

Hi, Rodney -

I'm back onto the Marion Bragg data - can you give me an update on where you are with the sample pH documentation I requested? Also, can you explain why there is a fax copy (as well as a "regular" copy) of one of the chain of custody records in each of the data packages for this project?

Also - I'm going to assume that the ICV true value for ammonia and the ICV/CCV true values for chloride in this data package are the same as they were for the LDI data package that I just finished right???

Thanks. Carol

Carol Erikson
Trillium, Inc.
cerikson@trilliuminc.com
865/966-8880
865/966-8885 fax

Re: N1053:

- 1. Ammonia ICV TV = 6.03 (same sol'n as LCSW)
 - Incorrect spreadsheet used to process data. See attached amended run log. Summary forms are correct.

3.	ICV TV	CCVTV
* Chloride	40.0 mg/L	25.0 mg/L
Sulfate	40.0 mg/L	50.0 mg/L
Nitrate	1.00 mg/L	2.50 mg/L
Nitrite	1.00 mg/L	2.50 mg/L

- 4. Dilution factors were not consistently corrected as necessary on the run logs. All initial analyses are performed at a 5X dilution. Due to the low MDLs, we are able to maintain our RL with the 5X and improve the production on the IC. The summary run logs have been corrected for the dilution factors as necessary and are included.
- 5. The data reported for nitrate and nitrite for sample MW113 (as well as samples MW1030 and MW-1050) was from the earlier run on 9/18/02. The chloride and sulfate was not reported from this analysis because the CCV and LCSW were not within acceptable ranges. Because of this, the instrument was recalibrated and the samples were reanalyzed. This is where the results from 9/19/02 came from. The nitrate and nitrite can not be reported from this analysis because it occurred after the required holding time.
- 6. See above (#5) for explaination.
- 7. See corrected summary run logs. The appropriate LCSW analyses are marked on the run logs. There was one value for nitrate that was changed for LCSW2. We realize these results are difficult to track, however, we are attempting to make certain the correct numbers are being reported for the LCS values for the associated results.
- 8. This page was apparently missed when the original raw data was copied. The raw data has been re-processed and the CCB results are attached.

Jan 28-02



DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

WET CHEMISTRY ANALYSIS DATA Chemical Oxygen Demand (COD) in Water

CET Report Dated October 4, 2002 September 2002 Sample Collections

Chemical Analyses Performed by:

Chemical & Environmental Technology, Inc. Research Triangle Park, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, TN 37922
(865) 966-8880

November 6, 2002

92241/CAE/ESC \MARION\Sept02\cod



EXECUTIVE SUMMARY

Validation of the wet chemistry analysis data (chemical oxygen demand [COD]) prepared by Chemical & Environmental Technology, Inc. (CET), under subcontract to CompuChem Environmental, for 14 water samples and one field blank from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package that had no identification number but was dated October 4, 2002. This data package was received for review on October 11, 2002, with additional documentation provided on October 24, 2002, and November 6, 2002. The following field samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)	PW01PB (PW-1)	SW01PB (SW-1)
SW01DPPB (SW-1D)	SW02PB (SW-5)	SW03PB (SW-6)

Based on the validation effort, reported sample results were qualified or corrected as follows:

- The result for COD in SW01DPPB was qualified as less than the reported value (10.4 U).
- All sample results for COD (including reporting limits) were recalculated by the validator and reported to reflect three significant figures (rather than two, as reported by the laboratory).

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section IX). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section VIII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the COD data.



INTRODUCTION

Analyses were performed according to EPA's "Chemical Analysis of Water and Wastes" (EPA-600/4-79-020), March 1983, Method 410.4. Since no guidelines specific to the analytical method used are available, the validation was based on the requirements of the referenced procedure, the specifications of the project-specific Quality Assurance Project Plan (QAPP), and best professional judgment. The validation approach was similar to that described in EPA's "National Functional Guidelines for Inorganic Data Review" (EPA-540/R-94/013, February 1994). Results of sample analyses were reported by the laboratory without qualifications.

The data validation process is intended to evaluate data on a technical basis rather than a contract or method compliance basis. An initial assumption is that the data package contains sufficient raw data documentation to facilitate the validation process, comparable to the level of documentation required in a Contract Laboratory Program (CLP) data package.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this review, qualifier codes may be added by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with EPA's National Functional Guidelines:

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- R The data are unusable. (Note: The analyte may or may not be present.)
- J The associated value is an estimated quantity.
- UJ The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the client-customized data tables (Attachment A) and the laboratory's Analytical Reports (Attachment B) to qualify the results as appropriate according to the review of the data package.

Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last



resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The water samples were collected on 9/17-18/02. All COD analyses were conducted well within the 28-day holding time specified by both the referenced method and the QAPP.

An acceptable (4°C ±2°C) cooler temperature on receipt of the samples at CET (5°C) was recorded on the chain of custody (COC) records documenting the shipment of samples from CompuChem to CET. Preservation with sulfuric acid and ice was recorded on one of the two applicable COCs by CompuChem, but no documentation of sample pH on receipt at CET was found in the data package. However, the use of sulfuric acid and ice was documented on the field COCs (documenting shipment of the samples from the site to CompuChem) and verification of successful acidification of the COD sample containers was documented on CompuChem's receiving logs, all of which were provided in CompuChem's data packages for the other analysis parameters requested on these samples. Therefore, no action was taken on this basis.

II. Calibrations

The reported COD analyses were performed on 9/24/02 and 9/27/02. Raw data documentation of an initial calibration (IC) performed on 6/3/02 was provided on 10/24/02 at the validator's request; this date was recorded on the bench sheets for each analysis date, but it was not clear to what it referred until the raw IC data were received (see Attachment C).

The 6/3/02 IC was established using five standard concentrations ranging from 10 mg/L to 150 mg/L. The best-fit linear regression describing the calibration curve gave an acceptable correlation coefficient (>0.995) and was verified by the validator.

A check standard at 75 mg/L was run at the start of each COD analysis series. Acceptable recoveries (QC 85-115%) were reported (98% and 92%) and verified by the validator.

Raw data for a high range IC run on 6/3/02 were also provided by the laboratory on 10/24/02. However, this IC was not relevant to any of the reported sample analyses; therefore, it was not reviewed as part of this validation effort.

III. Blanks

A blank was run at the start and end of each COD analysis series. No absorbance response was documented for either of these blanks.

One field blank, GW09FBPB, was submitted with this sample set. COD was not detected above the laboratory-specified reporting limit (RL) of 10 mg/L in the field blank.



IV. Laboratory Control Samples (LCS)

No LCSs were run in association with these samples.

V. Laboratory and Field Duplicate Analyses

A. <u>Laboratory Duplicates</u>

GW08DPPB and PW01PB were each run in duplicate by the laboratory. COD was not detected above the RL in either analysis of GW08DPPB, therefore no quantitative evaluation of precision could be made using these data. Excellent reproducibility (0 relative percent difference, RPD) was demonstrated for COD in the duplicate analyses of PW01PB.

B. Field Duplicates

Sample GW08DPPB was identified as a field duplicate of GW08PB. COD was not detected above the laboratory-specified RL in either sample, therefore no quantitative evaluation of precision could be made using these data.

SW01DPPB was identified as a field duplicate of SW01PB. COD was reported at a very low concentration (10.4 mg/L) in SW01DPPB but was not detected (10.0 U) in SW01PB. The result for COD in SW01DPPB was qualified as less than the reported value (10.4 U) due to lack of confirmation in the field duplicate analyses.

VI. Matrix Spike Analysis

No matrix spike analyses were reported in this data package.

VII. Sample Results Verification

All sample results for COD were correctly calculated and accurately reported by the laboratory.

The laboratory-specified RL of 10 mg/L is equivalent to the low concentration standard used to establish the initial calibration, and is therefore supported by the data as presented.

All sample results were greater than or equal to 10 mg/L and were reported to two significant figures by the laboratory; this is consistent with the results as found on the bench sheets. However, the historical data generated in support of this project reflect three significant figures for results that are greater than or equal to 10.0 mg/L. Since raw data for the relevant IC were provided by the



laboratory, the sample results could be calculated by the validator and reported to three significant figures, where appropriate, for consistency with the historical project data. Positive results for COD in GW07PB, GW03PB, GW04PB, GW05PB, GW06PB, PW01PB, and SW01DPPB and the RLs for all remaining samples in this data set were so corrected by the validator.

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was affected by the findings of the validation effort.

VIII. Documentation

Field-initiated COC records were not included in the COD data package, but were available in the CompuChem data packages for the other analysis parameters run on these samples. Two COC records documenting transfer of the samples from CompuChem to CET were present; all samples reported in this data set were listed on these forms. The following issues were noted:

- Sample pHs were not recorded on either of the COCs by CET on sample receipt.
- On COC #S11292, no preservation information was recorded by CompuChem.
- No courier information was documented, nor was a copy of the courier airbill (if applicable) included in the data package.
- On both COC records, the dates accompanying the first "Received by" CET signature
 and the subsequent "Relinquished by" CET signature were incomplete; no year was
 recorded.
- On COC #S11292, the collection date for the "SW-" samples appears to read "9/19/02," and this date was used by CET on their reporting forms. However, the field COCs in the CompuChem data packages indicate a collection date of 9/17/02 for these samples. No corrections were made to the interlaboratory COC by the validator, but the collection dates on the Final Reports of Analysis for the affected samples were corrected to 9/17/02 (from 9/19/02).

In their first response to the validator's request for missing IC raw data, the laboratory provided a second copy of the original COD data package on 10/16/02. In response to a repeated request for the same information, CET provided (through CompuChem) the appropriate raw data for the relevant IC. The IC raw data pages were inserted into the original data package by the validator.

In the data package as received for review, the 9/27/02 laboratory bench sheet indicates that absorbance was measured at 460 nm. On all other documentation in the data package, absorbance at 600 nm (as specified by the method) is recorded. At the request of the validator, the laboratory



provided a corrected bench sheet for the 9/27/02 analyses. This page was inserted into the data package by the validator.

These documentation issues do not directly affect the technical validity of the analytical data generated, but they could be problematic if the data were used in litigation.

IX. Overall Assessment

Based on the validation effort, reported sample results were qualified or corrected as follows:

- The result for COD in SW01DPPB was qualified as less than the reported value (10.4 U) due to lack of confirmation in the field duplicate analyses.
- All sample results for COD (including RLs) were recalculated by the validator and reported to reflect three significant figures (rather than two, as reported by the laboratory) for consistency with the historical data generated for this project.

Documentation issues are discussed in Section VIII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the COD data.



ATTACHMENT A

DATA TABLES
COD in Water
September 2002 Sample Collections - Marion Bragg Landfill
CET Report dated October 4, 2002

Marion Bragg Landfill - September 2002 - Chemical Oxygen Demand in Ground Water and Surface Water

Results are in mg/L

Collection Point Sample ID ===================================	:====>), ===>	MB-1 GW08PB 200675 9/18/02	MB-1D GW08DPPB 200676 9/18/02	MB-2 GW07PB 200674 9/18/02	MB-5 GW03PB 200680 9/18/02	MB-6 GW04PB 200681 9/18/02	MB-7 GW05PB 200672 9/18/02	MB-8 GW06PB 200673 9/18/02	MB-9 GW02PB 200679 9/18/02
COD	10.0	10.0 U	10.0 U	21.3	10.4	16.9	25.6	64.8	10.0 U

Marion Bragg Landfill - September 2002 - Chemical Oxygen Demand in Ground Water and Surface Water

Results are in mg/L

Collection Point = Sample ID = Lab Sample No. = Collection Date.	===> ===>	MB-10 GW01PB 200678 9/18/02	Field Blank GW09FBPB 200677 9/18/02	PW-1 PW01PB 200686 9/17/02	SW-1 SW01PB 200684 9/17/02	SW-1D SW01DPPB 200685 9/17/02	SW-5 SW02PB 200682 9/17/02	SW-6 SW03PB 200683 9/17/02
COD	10.0	10.0 U	10.0 U	21.3	10.0 U	10.4 U	10.0 U	10.0 U



ATTACHMENT B

ANALYTICAL REPORTS

COD in Water

September 2002 Sample Collections - Marion Bragg Landfill

CET Report dated October 4, 2002

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200675 SAMPLE ID- GW08PB

SAMPLE MATRIX- GW

DATE SAMPLED- 09/18/02

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT

cas illo or

TIME SAMPLED- 1230

TIME RECEIVED- 1605

DELIVERED BY- CHRIS BRAND

RECEIVED BY- ALT

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

BY RESULT UNITS

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/24/02 JMB

210.0 <10 mg/L

10

CAENJULON

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

*FINAL REPORT OF ANALYSES

COMPUCHEM

Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200676 SAMPLE ID- GW08DPPB

SAMPLE MATRIX- GW

DATE SAMPLED- 09/18/02

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT

TIME SAMPLED- 1230

TIME RECEIVED- 1605

DELIVERED BY- CHRIS BRAND

RECEIVED BY- ALT

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

RESULT UNITS BY

210.0

PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/24/02 JMB

<10 mg/L

Carille/or

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200674 SAMPLE ID- GW07PB

SAMPLE MATRIX- GW

DATE SAMPLED- 09/18/02

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT

casilulo2

TIME SAMPLED- 1145

TIME RECEIVED- 1605

DELIVERED BY- CHRIS BRAND

RECEIVED BY- ALT

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

RESULT UNITS BY

PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/24/02 JMB

21.3 21 mg/L

(DE11/6/02

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200680 SAMPLE ID- GW03PB

MB-5 Caen/6/02

SAMPLE MATRIX- GW

DATE SAMPLED- 09/18/02

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT

TIME SAMPLED- 0850 RECEIVED BY- ALT

TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

RESULT UNITS BY

POL

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/27/02 JMB

10

PQL = Practical Quantitation Limit

CAE1/6/02

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200681 SAMPLE ID- GW04PB

MB-6

SAMPLE MATRIX- GW

DATE SAMPLED- 09/18/02

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT

CREINGION

TIME SAMPLED- 0930

TIME RECEIVED- 1605

DELIVERED BY- CHRIS BRAND

RECEIVED BY- ALT

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

RESULT UNITS

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/27/02 JMB

16.9 17 mg/L

ME116/02

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

CaE11/4/02

BY

SAMPLE NUMBER- 200672 SAMPLE ID- GW05PB

SAMPLE MATRIX- GW

DATE SAMPLED- 09/18/02

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT

TIME SAMPLED- 1000

TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

RECEIVED BY- ALT

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

RESULT UNITS

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/24/02 JMB

DATE

10

PQL = Practical Quantitation Limit

QE146/02

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200673 SAMPLE ID- GWO6PB MB-8

SAMPLE MATRIX- GW

DATE SAMPLED- 09/18/02

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT

TIME SAMPLED- 1030

COE 116/02 TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

RECEIVED BY- ALT

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

DATE

ANALYSIS

METHOD

BY

POL

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/24/02 JMB

64.8 65 mg/L

RESULT UNITS

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

CAE 11/6/02

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200679 SAMPLE ID- GW02PB

SAMPLE MATRIX- GW

DATE SAMPLED- 09/18/02

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT

CAE 11/6/02

TIME SAMPLED- 0815 RECEIVED BY- ALT

TIME RECEIVED- 1605

DELIVERED BY- CHRIS BRAND

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

BY RESULT UNITS POL

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/27/02 JMB

<10.0 <-10 mg/L

MEII/6/or

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200678 SAMPLE ID- GW01PB

DATE SAMPLED- 09/18/02

MB-10

SAMPLE MATRIX- GW

TIME SAMPLED- 0940

TIME RECEIVED- 1605

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT DELIVERED BY- CHRIS BRAND

CaE 11/6/02

RECEIVED BY- ALT

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

RESULT UNITS BY 410.0

POL

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/27/02 JMB

-10 mg/L

10

PQL = Practical Quantitation Limit

Car 116/02 Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM

Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

CaEII/6/02

Field Blank

SAMPLE NUMBER- 200677 SAMPLE ID- GW09FBPB

SAMPLE MATRIX- GW

DATE SAMPLED- 09/18/02

TIME SAMPLED- 1410

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

RECEIVED BY- ALT

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

RESULT UNITS BY 210.0

POL

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/27/02 JMB

10 mg/L

me 11/6/02

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM

Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200686 SAMPLE ID- PW01PB

SAMPLE MATRIX- GW

DATE SAMPLED- 09/17/02

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT

TIME SAMPLED- 1705 CAE 11/6/02

RECEIVED BY- ALT

TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

RESULT UNITS BY

PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/27/02 JMB

21.3 21 mg/L

ME 1/4/02

10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200684 SAMPLE ID- SWO1PB 5W-1 CAR 116/02 DATE SAMPLED- 99/19/02 9/17/02 CAE 10/30/02

SAMPLE MATRIX- GW TIME SAMPLED- 1615 RECEIVED BY- ALT

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT TIME RECEIVED- 1605

DELIVERED BY- CHRIS BRAND

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

RESULT UNITS ΒY

PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/27/02 JMB

∠10.0 <10 mg/L

10

PQL = Practical Quantitation Limit

(DE11/6/02

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD 501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

5W-10 car 116/02

SAMPLE NUMBER- 200685 SAMPLE ID- SW01DPPB DATE SAMPLED- 09/19/02 9/17/02

CaEIdsdor DATE RECEIVED- 09/19/02 SAMPLER- CLIENT

SAMPLE MATRIX- GW TIME SAMPLED- 1615 RECEIVED BY- ALT

TIME RECEIVED- 1605

DELIVERED BY- CHRIS BRAND

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

RESULT UNITS BY

PQL

CHEMICAL OXYGEN DEMAND

09/27/02 JMB EPA 410.4

10,4 U 10 mg/L

10

PQL = Practical Quantitation Limit

aculator Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER - 200682 SAMPLE ID- SW02PB ...
DATE SAMPLED - 09/19/02 9/17/02 CAE 10/30/02
DATE RECEIVED - 09/19/02 SAMPLER - CLIENT

5W-5 caenlulor

SAMPLE MATRIX- GW TIME SAMPLED- 1500 RECEIVED BY- ALT

TIME RECEIVED- 1605

DELIVERED BY- CHRIS BRAND

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

BY RESULT UNITS < 10.0

PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/27/02 JMB

-10 mg/L CAE 11/4/02 10

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM Attn: DIANE BYRD

501 MADISON AVENUE CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200683 SAMPLE ID- SW03PB DATE SAMPLED- 09/19/02

9/17/02 Ca & 10/30/02

5W-6 CAE116/02

SAMPLE MATRIX- GW TIME SAMPLED- 1505 RECEIVED BY- ALT

DATE RECEIVED- 09/19/02 SAMPLER- CLIENT TIME RECEIVED- 1605

DELIVERED BY- CHRIS BRAND

Page 1 of 1

PROJECT NAME : MARION BRAGG

ANALYSIS

ANALYSIS

METHOD

DATE

BY RESULT UNITS PQL

CHEMICAL OXYGEN DEMAND

EPA 410.4 09/27/02 JMB

410.0 <-10 mg/L

10

PQL = Practical Quantitation Limit

MEMbloz

Results followed by the letter J are estimated concentrations. NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724



ATTACHMENT C

EXAMPLE COD BENCH SHEET

COD in Water

September 2002 Sample Collections - Marion Bragg Landfill

CET Report dated October 4, 2002



Low COD

EPA Method 410.4

Date: 9/24/02 Time: 0922 Analyst:JMB 6/3/02

Lims Batch/	Sample #	Dilution Factor	Final Volume	Absorbance	Result	% Recovery	Digestion
Sample Type		(mi)	(ml)	at 600nm	(mg/l)	or RAPD	Time
	Blank	1	2	0.000	0.000		1016-1216
	Ck std 75mg/l	1	2	0.035	73.5	98%	
270035/GW	200433	1	2	0.015	_ 30		
	200434	11	2	0.009	17		
	200435	1	.2	0.009	17		
	200436	1	2_	0.005	< 10		
	200505	1	2	0.011	21		
	200672	1_	. 2	0.013	26		
	200673	1	2	0.031	65		
	200674	1	2	0.011	21		
	200675	1	2	0.002	< 10		
	200676	1	2	0.002	< 10		
	200676DUP	1	2	0.002	< 10	0%	
270034/WW	200694	1	2	0.023	47		

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DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

INORGANIC ANALYSIS DATA Dissolved Metals in Water

SDG No. RW1067 Samples Collected September 2002

Chemical Analyses Performed by:

CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

November 12, 2002

92241/CAE/DAS MARION\Sept02\DMetals2



EXECUTIVE SUMMARY

Validation of the inorganics analysis data (dissolved metals) prepared by CompuChem Environmental for nine water samples and one field blank from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package under Sample Delivery Group (SDG) No. RW1067, which were received for review on October 4, 2002, with additional information provided on October 28, 2002, and November 1 and 11, 2002. The following samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)		

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for nickel, selenium, silver, and sodium in all samples were qualified as estimated (J, UJ).
- Results for chromium, cobalt, and lead in all samples except GW06PB were qualified as estimated (J, UJ).
- Results for aluminum in GW08PB, GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, GW07PB, GW08DPPB, and GW09FBPB were qualified as less than the reported values (U).
- Results for barium and magnesium in GW09FBPB were qualified as less than the reported values (U).
- The result for beryllium in GW06PB was qualified as less than the reported value (U).
- Results for manganese in GW01PB and GW09FBPB were qualified as less than the reported values (U).
- Results for copper in GW01PB, GW08PB, GW02PB, GW03PB, and GW04PB were qualified as estimated (UJ).
- The result for iron in GW01PB was qualified as estimated (UJ).



- Results for antimony, copper, and potassium in GW09FBPB were qualified as estimated (J, UJ).
- Results for zinc in GW08PB, GW08PPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the reported values (U).
- Results for vanadium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, GW01PB, and GW09FBPB were qualified as estimated (J, UJ).
- Results for antimony in GW08PB, GW07PB, GW03PB, GW04PB, and GW01PB were qualified as less than the reported values (U).
- Results for arsenic in GW08DPPB and GW02PB were qualified as estimated (J).

All "B" and "E" flags applied by the laboratory were removed by the validator.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIII). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XII of this report.

This validation report should be considered <u>part of the data package</u> for all future distributions of the inorganics data.



INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work ILM04.0. All target analytes (dissolved metals) were analyzed using trace ICP (inductively coupled plasma) and cold vapor atomic absorption (CVAA) instrumentation. Results of analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes denote specific information regarding the analytical results.

Trillium's validation was performed in accordance with the EPA "National Functional Guidelines for Inorganic Data Review" (EPA 540/R-94/013, 2/94). The EPA Region II Standard Operating Procedure (SOP) No. HW-2, (Revision XI), January 1992, "Evaluation of Metals Data for the Contract Laboratory Program (CLP)" was also used as guidance for the validation effort, and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the review, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes as defined by the National Functional Guidelines:

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- R The data are unusable. (Note: The analyte may or may not be present.)
- J The associated value is an estimated quantity.
- UJ The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables contained in Attachment A as well as on the Inorganic Analysis Data Sheets (Form Is) in Attachment B of this validation report to qualify the results as appropriate according to the review of the data package.



Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The ground water samples and field blank were collected 9/18/02. All metals analyses were conducted on 9/25/02, which is well within acceptable holding times (28 days for mercury and six months for all other analytes).

Field filtration of the ground water samples for dissolved metals analysis was not clearly documented by the sampling team on the applicable chain of custody (COC) records. A "B" (for "both") was recorded on each COC in the field used to designate filtered or unfiltered; no clarification of what was filtered and unfiltered was documented. For the purposes of this validation effort, it was assumed that the appropriate sample containers for dissolved metals analysis were field-filtered prior to chemical preservation.

Chemical preservation of the ground water samples for dissolved metals analysis with nitric acid and ice was clearly documented on the COCs. Acceptable cooler temperatures (4-6°C) on laboratory receipt were recorded on both COCs and on the laboratory's receiving logs. Acceptable sample pHs (<2) were not documented on the COCs but were recorded on the applicable receiving and preparation logs. Therefore, successful sample preservation in the field was confirmed.

A sampler notation on one of the COCs indicated that sample GW09FBPB needed to be filtered and preserved in-house (i.e., at the laboratory). No further information regarding this specification was found in the data package as received for review. On request, the laboratory provided a Quality Assurance (QA) notice indicating that GW09FBPB was at pH 7 on laboratory receipt and that it was both filtered and chemically preserved to pH<2 by the laboratory. No further action was necessary.

According to the data package narrative, all samples were received intact and in good condition.

II. Calibrations

Sample analyses for all Trace ICP target elements were performed in a single analysis series on 9/25/02 on an instrument identified as "P4." Mercury analyses were performed in a single CVAA series run on 9/25/02 on an instrument identified as "V3." A linearity check at the start of the CVAA series gave an acceptable correlation coefficient (>0.995). Initial and continuing calibration verification (ICV/CCV) standards were satisfactory for all metals reported from both applicable analysis series (90-110% for all ICP target analytes and 80-120% for mercury).

Contract required detection limit (CRDL) standards were run at regular intervals throughout the ICP analysis series; all applicable analytes were at the required concentrations (2xCRDL). Recoveries were acceptable (80-120%) in the CRDL standards bracketing the sample analyses except for selenium (71.9%) in the mid-series CRDL standard and lead (77.5%) in the series-ending CRDL



standard. Since all of the samples were analyzed toward the end of the analysis series, results for selenium in all samples and for lead in all samples except GW06PB were qualified as estimated (UJ) based on the low CRDL standard recoveries. The result for lead in GW06PB was greater than four times the CRDL, therefore this result did not require qualification based on the low CRDL standard recovery.

A CRDL standard was also run at the start of the analysis series for mercury. The recovery for mercury in this standard (105%) was acceptable.

III. Blanks

No metals calibration blanks had values above the CRDLs or less than the negative CRDLs for any target element. However, responses above the applicable instrument detection limits (IDLs) were found for various combinations of 11 different elements (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, iron, magnesium, manganese, and potassium) in each of the initial and continuing calibration blanks (ICB/CCBs); in addition, results for one or more of 11 elements (cobalt, chromium, copper, iron, lead, nickel, potassium, selenium, silver, sodium, and vanadium) that were below the negative IDLs were also reported in each of the ICB/CCBs. Results for samples analyzed within five runs of an affected ICB/CCB warrant qualification if the sample result is less than five times the positive blank value or less than two times the absolute value of the negative blank value. The following sample results were qualified as less than the reported values (U) due to contamination in the associated calibration blanks:

- Aluminum in GW08PB, GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, GW07PB, GW08DPPB, and GW09FBPB.
- Barium and magnesium in GW09FBPB.
- Beryllium in GW06PB.
- Manganese in GW01PB and GW09FBPB.

The result for arsenic in GW08DPPB warranted qualification as less than the reported value (8.2 U) due to the presence of arsenic in the associated CCB at 2.7 µg/L. However, based on other available quality control data and the validator's professional judgment, this qualifier was not applied. See Section IX for further discussion.

The following sample results were qualified as estimated (UJ) based on negative responses in the associated calibration blanks:



- Chromium, copper, and silver in GW01PB, GW08PB, GW02PB, GW03PB, and GW04PB.
- Iron in GW01PB.
- Potassium in GW09FBPB.
- Selenium in GW09FBPB, GW05PB, GW06PB, GW07PB, and GW08DPPB.

Sample results for all remaining elements for which positive or negative responses were found in the ICB/CCBs were not affected by the associated calibration blank values.

One preparation blank (PBW) was prepared and analyzed with the samples in this SDG. Responses for aluminum (18.62 μ g/L), barium (0.29 μ g/L), chromium (-0.83 μ g/L), cobalt (-0.56 μ g/L), magnesium (59.15 μ g/L), nickel (-166.20 μ g/L), silver (-0.53 μ g/L), vanadium (-0.38 μ g/L), and zinc (2.04 μ g/L) were reported in the preparation blank. The following sample results were qualified as less than the reported values (U) based on associated preparation blank contamination:

- Aluminum in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB.
- Barium and magnesium in GW09FBPB.
- Zinc in GW08PB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB.

The following sample results were qualified as estimated (J, UJ) due to negative responses in the preparation blank:

- Chromium and vanadium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, GW01PB, and GW09FBPB.
- Cobalt in GW05PB, GW02PB, GW01PB, and GW09FBPB.
- Nickel and silver in all samples.

Some of the actions warranted based on PBW responses are redundant with actions taken based on ICB/CCB results; no additional action was taken in these cases.

One field blank, GW09FBPB, was prepared in association with this data set. After qualifications based on laboratory blank contamination, antimony (2.5 μ g/L), calcium (609 μ g/L), copper (1.1 μ g/L), sodium (124 μ g/L), and zinc (10.2 μ g/L) were detected in this field-submitted



blank. Results for antimony in GW08PB, GW07PB, GW03PB, GW04PB, and GW01PB and for zinc in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the reported values (U) based on associated field blank contamination. No other sample results were affected by the field blank values.

IV. ICP Interference Check Sample

All interference check sample results were satisfactory (80-120 percent recovery).

V. Laboratory Control Sample

One laboratory control sample (LCS) was run for all ICP target analytes in association with this SDG. All laboratory control sample results for the ICP target analytes were satisfactory (80-120 percent recovery).

Based on the available documentation, no LCS samples were prepared or analyzed for mercury.

VI. Laboratory Duplicate Analysis

Duplicate analysis was performed on sample GW08PB for all target analytes. Relative percent differences (RPDs) between positive paired analytes in GW08PB and its duplicate were below the maximum acceptance limit of 20% for all elements detected at concentrations greater than five times the CRDL. For elements detected at concentrations less than five times the CRDL in the paired analyses, the difference between the paired results must be less than ±CRDL. This criterion was met for all applicable target analytes.

A positive result below the CRDL for lead was reported in the duplicate analysis (1.6 μ g/L) but was not confirmed in the original analysis (1.3 U). Lead was also not detected in the field duplicate of GW08PB (GW08DPPB). Since the reported sample result for lead was already "not detected," no action was necessary based on the laboratory duplicate comparison.

VII. Matrix Spike Analysis

Matrix spike analysis was performed on sample GW08PB with acceptable recoveries (75-125%) for all target elements.



VIII. ICP Serial Dilution

Serial dilution analysis was performed on sample GW08PB. Results for elements with initial (undiluted) results greater than 50xIDL were acceptable (less than 10 percent difference) except for sodium (14.9%). Results for sodium in all samples were qualified as estimated (J) based on this serial dilution result.

The "E" flags appropriately applied by the laboratory to all of the positive site sample results for sodium were removed by the validator.

IX. Field Duplicates

Sample GW08DPPB was identified as a field duplicate of GW08PB. RPDs between positive paired results were acceptable (QAPP QC ≤25 RPD) for barium (2.1 RPD), calcium (1.7 RPD), iron (0.7 RPD), magnesium (1.8 RPD), manganese (0.6 RPD), nickel (6.4 RPD), potassium (2.2 RPD), and sodium (4.0 RPD), but exceeded the QAPP-specified acceptance limit for cobalt (30 RPD). Results for cobalt in GW08PB and GW08DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.

Laboratory-reported results for arsenic in GW08PB ($9.0~\mu g/L$) and GW08DPPB ($8.2~\mu g/L$) showed good reproducibility (9.3~RPD). Arsenic was also detected in the laboratory duplicate analysis of GW08PB ($6.7~\mu g/L$). The three detections of arsenic in samples from this location and the fact that arsenic has been detected at this location in previous sampling events support the conclusion that arsenic is a true sample component. However, the result for arsenic in GW08DPPB warranted qualification based on associated blank contamination (see Section III) and the results for arsenic in GW08PB and its laboratory duplicate did not. Based on all the available quality control data and professional judgment, the result for arsenic in GW08DPPB was qualified as estimated (J) rather than as less than the reported value.

X. Sample Results Verification

Positive sample results were accurately reported from the raw data and IDLs established within three months prior to these sample analyses (on 7/15/02 for all ICP elements on P4 and for mercury on V3) were appropriately reported for those elements that were not detected.

Elevated %RSDs (>20%) among the triplicate measurements taken for each element in each run were found for numerous elements reported at concentrations just slightly above the applicable IDLs. Many of these results were subsequently qualified as less than the reported values due to associated blank contamination or as less than the CRDL due to lack of laboratory or field duplicate confirmation; no additional action was necessary in these cases. Those sample results that were not



so qualified were qualified by the validator as estimated (J) due to the high %RSDs; these values must be considered estimates based on the inconsistent responses obtained at the measured concentrations. The following results were qualified on this basis:

- Arsenic in GW02PB (28.6%).
- Cobalt in GW07PB (26.5%), GW03PB (23.2%), GW04PB (33.6%).
- Antimony (103%) and copper (42.5%) in GW09FBPB.

Positive sample results greater than the applicable IDLs but below the CRDLs were correctly reported by the laboratory with "B" qualifiers. As concentrations approach the IDL the accuracy of the measurement decreases; values closer to the CRDL, however, are probably quite accurate. Therefore, a guideline of 2xIDL was used to determine whether the reported results warranted qualification; specifically, sample results below the respective CRDL, less than 2xIDL and not otherwise qualified warrant qualification as estimated (J). No sample results warranted qualification on this basis.

All "B" qualifiers applied by the laboratory were removed by the validator.

XI. Other QC

Total metals analyses were not performed on these samples.

XII. Documentation

The two applicable chain of custody (COC) records were present in the data package and included all samples reported in this SDG. The following issues were noted:

- Despite a specific request on the COCs, sample pHs on laboratory receipt were not recorded on the COCs.
- A second, facsimile copy of COC #061476 was also included in this data package. The facsimile was signed by the same person and showed the same date/time of laboratory receipt as the "original." However, the two signatures are not identical and the facsimile does not contain two laboratory notations regarding sample condition on laboratory receipt that are on the "original." No explanation for this additional copy of one of the COC records was provided by the laboratory.



- Copies of the courier airbills were not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on each COC record.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should <u>not</u> be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are <u>laboratory-initiated quality control</u>; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

No data package narrative was present in the data package received for review. At the validator's request, the laboratory provided the missing pages via facsimile on 11/1/02. The pages were added to the data package as pages 3A and 3B by the validator.

A QA notice indicating that GW09FBPB was at pH 7 on laboratory receipt and that it was both filtered and chemically preserved to pH 2 by the laboratory was provided by the laboratory via facsimile on 10/31/02, at the validator's request. This document was inserted into the data package as page 220A by the validator.

The laboratory receiving log in the data package received for review did not include any sample pH values measured on receipt at the laboratory. At the validator's request, a corrected receiving log was provided by the laboratory via facsimile on 10/31/02. This corrected record showed acceptable pH values for the dissolved metals samples (pH<2 in all cases), but was incorrect for the ammonia samples (see the wet chemistry validation report for further information). The laboratory was contacted a second time by the validator and a second corrected receiving log was provided via UPS on 11/11/02. The final corrected document was inserted into the data package for SDG #RW1067 as page 220 by the validator, replacing the originally-provided page.

These COC documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XIII. Overall Assessment

Based on the validation effort, dissolved metals results for samples in SDG No. RW1067 and were qualified as follows:



- Results for selenium in all samples were qualified as estimated (UJ) based on an
 unacceptably low recovery in an associated CRDL standard. Results for selenium in
 GW09FBPB, GW05PB, GW06PB, GW07PB, and GW08DPPB were similarly
 qualified based on negative responses in the associated calibration blanks.
- Results for lead in all samples except GW06PB were qualified as estimated (UJ) based on an unacceptably low recovery in an associated CRDL standard.
- Results for aluminum in GW08PB, GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, GW07PB, GW08DPPB, and GW09FBPB were qualified as less than the reported values (U) due to contamination in the associated preparation and/or calibration blanks.
- Results for barium and magnesium in GW09FBPB were qualified as less than the reported values (U) due to contamination in the associated calibration and preparation blanks.
- The result for beryllium in GW06PB was qualified as less than the reported value (U) due to contamination in the associated calibration blank.
- Results for manganese in GW01PB and GW09FBPB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.
- Results for chromium in GW01PB, GW08PB, GW02PB, GW03PB, GW04PB GW08DPPB, GW07PB, GW05PB, and GW09FBPB were qualified as estimated (UJ) based on negative responses in the associated calibration and/or preparation blanks.
- Results for copper in GW01PB, GW08PB, GW02PB, GW03PB, and GW04PB were
 qualified as estimated (UJ) based on negative responses in the associated calibration
 blanks.
- The result for iron in GW01PB was qualified as estimated (UJ) based on a negative response in the associated calibration blank.
- The result for potassium in GW09FBPB was qualified as estimated (UJ) based on a negative response in the associated calibration blank.
- Results for zinc in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the reported values (U) based on associated preparation and/or field blank contamination.



- Results for vanadium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, GW01PB, and GW09FBPB were qualified as estimated (J, UJ) due to negative responses in the preparation blank.
- Results for cobalt in GW05PB, GW02PB, GW01PB, and GW09FBPB were qualified as estimated (J, UJ) due to negative responses in the preparation blank.
- Results for nickel in all samples were qualified as estimated (J, UJ) due to negative responses in the associated preparation blank.
- Results for silver in all samples were qualified as estimated (UJ) due to negative responses in the associated preparation blank. Results for silver in GW01PB, GW08PB, GW02PB, GW03PB, and GW04PB were similarly qualified based on negative responses in the associated calibration blanks.
- Results for antimony in GW08PB, GW07PB, GW03PB, GW04PB, and GW01PB were qualified as less than the reported values (U) based on associated field blank contamination.
- Results for sodium in all samples were qualified as estimated (J) based on an unacceptable serial dilution result for this analyte.
- Results for cobalt in GW08PB and GW08DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.
- The result for arsenic in GW08DPPB was qualified as estimated (J) based on all available quality control data and professional judgment.
- The result for arsenic in GW02PB was qualified as estimated (J) based on an elevated %RSD value among the triplicate ICP measurements.
- Results for cobalt in GW07PB, GW03PB, and GW04PB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.
- Results for antimony and copper in GW09FBPB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.

All "B" and "E" flags applied by the laboratory were removed by the validator.

Documentation issues observed in the data package are discussed in Section XII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the inorganics data.



ATTACHMENT A

DATA TABLES SDG No. RW1067 Dissolved Metals in Water

Marion Bragg Landfill - September 2001 - Dissolved Metals in Ground Water and Surface Water Samples

All Results are in ug/L

Collection Po		MB-1	MB-1D	MB-2	MB-5		MB-6	MB-7		MB-8	MB-9
Sample ID =		GW08PB	GW08DPPB	GW07PB	GW03PB		GW04PB	GW05PE	3	GW06PB	GW02PB
Lab Sample N		RW1067-8	RW1067-9	RW1067-7	RW1067-3		RW1067-4	RW1067-		RW1067-6	RW1067-2
Collection Da		9/18/02	9/18/02	9/18/02	9/18/02		9/18/02	9/18/02		9/18/02	9/18/02
	CRDL	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2 · 2 2 · 3 <u>2</u>	2122122			21.40.40	2.23.32		2720.02	3, 10, 02
Aluminum	200	23.4 U	36.7 U	49.7 U	24.8	U	23.0 L	16.5	U	2410	36.7 U
Antimony	60	2.2 U	1.7 U	2.3 U	1.8	U	2.9 L	J 1.7	U	1.7 U	1.7 U
Arsenic	10	9.0	8.2 J	87.6	23.7		124	74.8		135	10.4 J
Barium	200	193	189	514	389		371	590		311	66.9
Beryllium	5	0.20 U	0.20 U	0.20 U	0.20	U	0.20 L	0.20	U	0.28 U	0.20 U
Cadmium	5	0.40 U	0.40 U	0.40 U	0.40	U	0.40 L	J 0.40	U	0.40 U	0.40 U
Calcium	5000	118000	116000	129000	94400		117000	98100		137000	57700
Chromium	10	0.40 U.	0.40 UJ	0.40 U	0.40	UJ	0.40 L	IJ 0.40	UJ	8.0	0.40 UJ
Cobalt	50	1.9 J	1.4 J	1.5 J	1.6	J	1.5 J	0.40	UJ	3.1	0.40 UJ
Соррег	25	0.80 U.	0.80 U	0.80 U	0.80	UJ	J 08.0	IJ 0.80	U	18.9	0.80 UJ
Iron	100	1520	1510	19600	7900		16100	11000	+	18200	2080
Lead	3	1.3 U.	1.3 UJ	1.3 U	J 1.3 1	UJ	1.3 U	JJ 1.3	UJ	30.3	1.3 UJ
Magnesium	5000	32800	32200	29100	28800		28600	32500)	87200	20700
Manganese	15	901	896	133	191		82.3	68.2		278	505
Mercury	0.2	0.10 U	0.10 U	0.10 U	0.10	U	0.10 t	J 0.10	U	0.10 U	0.10 U
Nickel	40	1.6 J	1.5 J	1.6 J	2.2 .	J	10.8 J	0.72	J	11.5 J	0.60 UJ
Potassium	5000	3160	3090	10800	6570		10300	15400)	27400	1620
Selenium	5	1.7 U.	I 1.7 UJ	1.7 U	1.7	UJ	1.7 t	JJ 1.7	UJ UJ	1.7 U	J 1.7 UJ
Silver	10	0.50 U.	0.50 UJ	0.50 U	J 0.50	UJ	0.50 U	J J 0.5 0	UJ	0.50 U	J 0.50 UJ
Sodium	5000	12600 J	12100 J	17000 J	15600 .	J	13100 J	31900	J	112000 J	8600 J
Thallium	10	4.2 U	4.2 U	4.2 U	4.2	U	4.2 L	J 4.2	U	4.2 U	
Vanadium	50	0.30 U	0.30 UJ	0.30 U	J 0.30	UJ	0.30 t	JJ 0.30	UJ	5.6	0.30 UJ
Zinc	20	3.1 U	11.6 U	5.1 U	7.0	U	6.1 U	J 8.1	U	80.8	3.1 U

Marion Bragg Landfill - September 2001 - Dissolved Metals in Ground Water and Surface Water Samples

All Results are in ug/L

1111 100 1010	ATE ITI UE/LI							
Collection Po	oint ===>	MB-10		Field Blank				
Sample ID ==	 >	GW01PB		GW09FBI	PB			
Lab Sample 1	No. ===>	RW1067-1		RW1067-10				
Collection D	9/18/02		9/18/02					
	CRDL							
Aluminum	200	21.5	U	141	U			
Antimony	60	1.9	U	2.5	J			
Arsenic	10	2.5	U	2.5	U			
Barium	200	94.7		1.4	U			
Beryllium	5	0.20	U	0.20	U			
Cadmium	5	0.40	U	0.40	U			
Calcium	5000	111000		609				
Chromium	10	0.40	UJ	0.40	UJ			
Cobalt	50	0.40	UJ	0.40	UJ			
Copper	25	0.80	UJ	1.1	J			
Iron	100	8.6	UJ	8.6	U			
Lead	3	1.3	UJ	1.3	UJ			
Magnesium	5000	34300		88.7	U			
Manganese	15	1.5	U	0.59	U			
Mercury	0.2	0.10	U	0.10	U			
Nickel	40	0.60	·UJ	0.60	UJ			
Potassium	5000	2740		67.1	UJ			
Selenium	5	1.7	UJ	1.7	UJ			
Silver	10	0.50	UJ	0.50	UJ			
Sodium	5000	11800	J	124	J			
Thallium	10	4.2	U	4.2	U			
Vanadium	50	0.30	UJ	0.30	UJ			
Zinc	20	6.4	U	10.2				



ATTACHMENT B

INORGANIC ANALYSIS DATA SHEETS (Form Is)
SDG No. RW1067
Dissolved Metals in Water

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

											CT-TO O D D	
- Lab Name:	COMP	UCHEN	M.		Cont	ract:				MB.		
ab Code:	LIBR	TY	Case N	To.:	s	AS No.:			SDG	No.:	RW1067	
_ Matrix (so	il/wa	ter)	: WATER			Lab S	ample I	D:	RW10	67-8		
evel (low			LOW	•			Receive		9/19			
		•				Date !		u.	3/13	702		
Solids:	0.0											
_			Concent	ratio	n Units (ug	/L or mg/l	kg dry	wei	ght):	UG/	<u>r</u>	
			CAS No.		Analyte	Concent	ration	С	Q	М		
_		Ì	7429-90-5	- 12	Aluminum		23.4	12	lu	P	j	
		Ì	7440-36-0	12	Antimony	i	2.2	B	W	P	4	
		Ì	7440-38-2		Arsenic		9.0	F	Ī	P	i o	
-		Ì	7440-39-3	İ	Barium		193	17	1	P	11	
		Ì	7440-41-7	İI	Beryllium		0.20	Įυ	Ī	P	1	
		Ì	7440-43-9	i	Cadmium	1	0.40	U	1	P	Ī	
-		Ì	7440-70-2	İ	Calcium		118000			P	Ĩ	
		Ì	7440-47-3	i	Chromium		0.40	V	IUJ	P	Ī \	
		Ĩ	7440-48-4	10	Cobalt		1.9	P	IJ	P	į \	
-		Ĭ	7440-50-8	10	Copper		0.80	W	IUJ	P	1 1	
		Ī	7439-89-6] 3	ron		1520	1		P	12	
_		Ī	7439-92-1	1	ead		1.3	W	IUJ	P		
		Ī	7439-95-4	1	fagnesium		32800	1	1	P	1,	
		Ī	7439-96-5	1	langanese	1	901		i	P	1	
		Ī	7439-97-6	1	fercury	1	0.10	Įυ		cv	i	
		Ī	7440-02-0	1	lickel		1.6	B	IJ	P	j	
		- [7440-09-7	E	otassium		3160	B		P	<u>i</u> \	
_		Ī	7782-49-2	5	elenium	1	1.7	[)'	WJ	P	İ	
			7440-22-4	S	ilver	1	0.50	Ø	IUJ	P	<u>i</u> ×	
		Ī	7440-23-5	8	odium		12600		FJ	P	* X X	
		[7440-28-0	r [hallium	1	4.2	U		P	1. %	
			7440-62-2	V	anadium		0.30	٧	IUJ	P	2	
		L	7440-66-6	2	inc	<u> </u>	3.1	19/	<u> u</u>	P	B C	
_												
_Color Bef	fore:	COLO	RLESS	Clar	ity Before:	CLEAR		Te	exture	e:	· · · · · · · · · · · · · · · · · · ·	
Color Aft	ter:	COLO	PRLESS	Clar	ity After:	CLEAR		Aı	rtifac	ets:		
 Comments:	: 			~			-					
												

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

Lab Name:	COMP	JCHEM	Cont	ract:			MB-	GW08DPPB
Lab Code:				AS No.:		SDG 1	No .0	AE 11/7/02 RW1067/02
			····					KNIOOT
Matrix (so	il/wa	ter): WATER		Lab Sample I	D:	RW10	67-9	
Level (low	/med)	: LOW_		Date Receive	d:	9/19	/02	
t Solids:	0.0							
-		Concent	ration Units (ug	/L or mg/kg dry	wei	ght):	UG/	<u>r</u>
					1,	ļ.,		1
-		7429-90-5		36.7	₽	<u> u </u>	P	<u> </u>
		7440-36-0		1.7	(n	<u> </u>	P	ω^{\perp}
		7440-38-2	 ! 	8.2	18	<u> J_</u>	P	3
ı		7440-39-3	!		P	<u> </u>	P	10
		7440-41-7		0.20	U	<u> </u>	P	1 1
		7440-43-9		0.40	la	<u>!</u>	P	11
٠.		7440-70-2	Calcium	116000	1		P	<u> </u>
		7440-47-3		_ <u>'</u>	<u> </u>	UJ	P	! (
		7440-48-4	Cobalt	1.4	18	J	P	<u> </u>
		7440-50-8	Copper	0.80	lu	<u> </u>	P	14
		7439-89-6	Iron	1510		<u> </u>	P	l m
		7439-92-1	Lead	1.3	111	UJ	P	
		7439-95-4	Magnesium	32200	<u> </u>	<u> </u>	P	!
		7439-96-5	Manganese	896		<u> </u>	P	! }
		7439-97-6	Mercury	'	U	<u> </u>	cv	!
		7440-02-0	Nickel	_ <u>'</u>	P	J	P	<u> </u>
		7440-09-7	Potassium		P	<u> </u>	P	[\
		7782-49-2	Selenium	1.7	12/	UJ	P	ر ا
		7440-22-4	Silver	0.50	W	W	P	6
		7440-23-5	Sodium	12100		V J	<u> </u>	\mathcal{X}
		7440-28-0	Thallium		U	<u> </u>	P	Z.X
		7440-62-2	Vanadium		W	UJ	P	8
		7440-66-6	Zinc	11.6	F	1 4	P	É
Color Bef	fore:	COLORLESS	Clarity Before:	CLEAR	Te	exture	: .	
Color Aft	ter:	COLORLESS	Clarity After:	CLEAR	Aı	rtifac	ts:	
Comments:								
JOHNETIUS,								
	•							

U. S. EPA-CLP -1-

INORGANIC ANALYSES DATA SHEET

- Lab Name: COM	DUCHEM	Conti				MB	GW07PB
ab Code: LIB					'	~	28 11702
ab code: Lib	RII Case	No.: S/	AS No.:		SDG 1	NO.:	RW1067
Matrix (soil/w	ater): WATER		Lab Sample I	D:	RW10	67-7	
evel (low/med): LOW		Date Receive	d:	9/19	/02	
Solids: 0.0							-
_	Concent	tration Units (ug/	L or mg/kg dry	weig	jht):	UG/	<u> </u>
	CAS No.	Analyte	Concentration	С	Q	М	}
_	7429-90-5	Aluminum	49.7	P	и	P	ω
	7440-36-0	Antimony	2.3	F	u	P	j 3
	7440-38-2	Arsenic	87.6			P	ĺ,
_	7440-39-3	Barium	514	1		P	Ĩ .
	7440-41-7	Beryllium	0.20	U		P	Î
	7440-43-9	Cadmium	0.40	U		P	Ĩ
-	7440-70-2	Calcium	129000			P	11
	7440-47-3	Chromium	0.40	19/1	UJ	P	Ī \
_	7440-48-4	Cobalt	1.5	19/1	J	P	Ĩ,
_	7440-50-8	Copper	0.80	[U]		P	6,1
	7439-89-6	Iron	19600	1 1		P	J. H.
_	7439-92-1	Lead	1.3	1	UJ	P	ĵ ^{\$7}
	7439-95-4	Magnesium	29100	1		P	ì
	7439-96-5	Manganese	133			P	Ì
_	7439-97-6	Mercury	0.10	U		cv	j /
	7440-02-0	Nickel	1.6	19/1	J	P	i (
	7440-09-7	Potassium	10800			P	j \
-	7782-49-2	Selenium	1.7	17/1	UJ	P	1,
	7440-22-4	Silver	0.50	آكرا	UJ	P	Ž
	7440-23-5	Sodium	17000		z J	P	1/6
-	7440-28-0	Thallium	<u>'</u>	ս		P	1.4
	7440-62-2	Vanadium			W	P	W
_	7440-66-6	Zinc	5.1	P	U	P	S
-							
_Color Before:	COLORLESS	Clarity Before:	CLEAR	Te	xture	: .	
Color After:	COLORLESS	Clarity After:	CLEAR	Ar	tifac	ts:	
- Comments: -						·	

U. S. EPA-CLP -1-

INORGANIC ANALYSES DATA SHEET

Lab Name: <u>COMP</u> Lab Code: LIBR	UCHEM TY Case No.	Contr	act: S No.:		 SDG 1	MB-	A
		5.					W11001
Matrix (soil/wa			Lab Sample I		RW106		· · · · · · · · · · · · · · · · · · ·
evel (low/med)	: LOW		Date Receive	d:	9/19/	02	
Solids: 0.0							
							•
	Concentra	tion Units (ug/	L or mg/kg dry	wei	ght):	UG/	<u>L</u>
	CAS No.	Analyte	Concentration	С	Q	М	
•	7429-90-5	Aluminum	24.8	F	u	P	j.,,
	7440-36-0	Antimony	1.8	P	IU	P	$\frac{1}{2}$
	7440-38-2	Arsenic	23.7	ĺ	1	P	18
•	7440-39-3	Barium	389	T	Ī	P	Ī
	7440-41-7	Beryllium	0.20	U	1	P	Ī
	7440-43-9	Cadmium	0.40	U	1	P]
	7440-70-2	Calcium	94400			P	1
	7440-47-3	Chromium	0.40	13/	IUJ	P	<u> </u>
	7440-48-4	Cobalt	1.6	B/	J	P] \
	7440-50-8	Copper	0.80	10	WJ	P	ا لأ
	7439-89-6	Iron	7900			P	1%
	7439-92-1	Lead	1.3	17	IUJ	P	
	7439-95-4	Magnesium	28800		<u> </u>	P] ,
	7439-96-5	Manganese	191	<u> </u>		P	1
	7439-97-6	Mercury	•	ր		cv	<u> </u>
	7440-02-0	Nickel	2.2	B	J	P	1
	7440-09-7	Potassium	6570		<u> </u>	P	! \
-	7782-49-2	Selenium	1.7	10	UJ	P	1
	7440-22-4	Silver	0.50		UJ	P	1 2
	7440-23-5	Sodium	15600		#J	P	126
	7440-28-0	Thallium	!	U		P	1 7
	7440-62-2	Vanadium	0.30		UJ	P	W
	7440-66-6	Zinc	7.0	B	u	P	18
-	7440-66-6	Zinc	7.0	P	и	P	Cara
Color Before:	COLORLESS C	larity Before:	CLEAR	T∈	exture	:	
Color After:	COLORLESS C	larity After:	CLEAR	Ar	tifac	ts:	
Comments:							

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INORGANIC ANALYSES DATA SHEET

Matrix (soil/water wevel (low/med): * Solids: 0.0	LOW		Lab Sample I Date Receive L or mg/kg dry Concentration 23.0 2.9	d: weig	9/19/	io.: 57-4	
Level (low/med):	CAS No. 7429-90-5 7440-36-0 7440-38-2 7440-39-3	Analyte Aluminum Antimony	Date Receive L or mg/kg dry Concentration 23.0	d: weig	9/19/ ght):	UG/I	-
Level (low/med):	CAS No. 7429-90-5 7440-36-0 7440-38-2 7440-39-3	Analyte Aluminum Antimony	Date Receive L or mg/kg dry Concentration 23.0	d: weig	9/19/ ght):	UG/I	-
	CAS No. 7429-90-5 7440-36-0 7440-38-2 7440-39-3	Analyte Aluminum Antimony	Concentration	C B	ght):	UG/I	<u>.</u>
* Solids: 0.0	CAS No. 7429-90-5 7440-36-0 7440-38-2 7440-39-3	Analyte Aluminum Antimony	Concentration 23.0	C	Ω	м	- -
-	CAS No. 7429-90-5 7440-36-0 7440-38-2 7440-39-3	Analyte Aluminum Antimony	Concentration 23.0	C	Q	м	<u>.</u> <u>.</u>
- -	CAS No. 7429-90-5 7440-36-0 7440-38-2 7440-39-3	Analyte Aluminum Antimony	Concentration 23.0	C	Q	м	
	7429-90-5 7440-36-0 7440-38-2 7440-39-3	Aluminum Antimony	23.0	B			
	7440-36-0 7440-38-2 7440-39-3	Antimony			u	B	
	7440-38-2 7440-39-3	- !	2.9	7-7		1 = 1	W
	7440-39-3	Arsenic		Œ	И	P	\$
			124			P	
-	7440-41-7	Barium	371			P	
-	<u></u>	Beryllium	0.20	ט		P	
-	7440-43-9	Cadmium	0.40	U		P	1
	7440-70-2	Calcium	117000	1		P	
	7440-47-3	Chromium	0.40	العرا	WJ	P	
	7440-48-4	Cobalt	1.5	13/	J	P	
•	7440-50-8	Copper	0.80	W	uJ	P	<i>d</i>
	7439-89-6	Iron	16100	1		P	4
	7439-92-1	Lead	1.3	1	UJ	P	
	7439-95-4	Magnesium	28600			P	j
	7439-96-5	Manganese	82.3	1 1		P	
•	7439-97-6	Mercury	0.10	U		CV	
	7440-02-0	Nickel	10.8	BI	\mathcal{J}	P	l
	7440-09-7	Potassium	10300			P	(
	7782-49-2	Selenium	1.7	VI	UJ	P	`
	7440-22-4	Silver	0.50	VI	UJ	P	\mathcal{E}
	7440-23-5	Sodium	13100		z J	P	$\tilde{\mathcal{N}}$
•	7440-28-0	Thallium	4.2	U		P	7.
	7440-62-2	Vanadium	0.30	18/	UJ	P	ω
	7440-66-6	Zinc	6.1	BI	u	P	ä

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW05PB

Actic (Soil/Water): WATER Lab Sample ID: RW1067-5 RW1	ib Name: <u>COMPUCH</u>	EM	_ Cont	ract:		7
Solids: 0.0 Concentration Units (ug/L or mg/kg dry weight): UG/L	b Code: LIBRTY	Case No.:	 :s.	AS No.:		
Solids: 0.0 Concentration Units (ug/L or mg/kg dry weight): UG/L	trix (soil/water): WATER		Lab Sample ID:	: RW1067-	5
Cas No.				_		
CAS No. Analyte Concentration C 0 M 7429-90-5 Aluminum 16.5 W P P 8 7440-36-0 Antimony 1.7 U P P 7440-38-2 Arsenic 74.8 P P 7440-39-3 Barium 5590 P P P 7440-41-7 Beryllium 0.20 W P P 7440-41-7 Beryllium 0.20 W P P P P P P P P P P P P P P P P P P	A61 (IOM\med):	LOW		Date Received:	9/19/02	
CAS No. Analyte Concentration C Q M W F F F W F F F W F F	Solids: 0.0	_				
CAS No. Analyte Concentration C Q M W F F F W F F F W F F				.		•
T429-90-5 Aluminum		Concentrat	cion Units (ug	L or mg/kg dry we	eight): UG	
T429-90-5 Aluminum						
7440-36-0 Antimony 1.7 U		CAS No.	Analyte	Concentration		$ \hspace{.06cm} $
7440-36-0 Antimony 1.7 U		7429-90-5	Aluminum	16.5	V U I	-
T440-38-2 Arsenic		<u></u>		-:		 :
		7440-38-2		74.8	P	7
7440-43-9 Cadmium 0.40 U P 7440-70-2 Calcium 98100 P 7440-47-3 Chromium 0.40 U U P 7440-48-4 Cobalt 0.40 U U P 7439-89-6 Iron 11000 P 7439-89-6 Iron 11000 P 7439-95-4 Magnesium 32500 P 7439-96-5 Manganese 68.2 P 7439-97-6 Mercury 0.10 U CV 7440-02-0 Nickel 0.72 V U P 7480-09-7 Potassium 15400 P 7480-22-4 Silver 0.50 V U P 7440-23-5 Sodium 31900 F P 7440-28-0 Thallium 4.2 U P 7440-66-6 Zinc 8.1 P U P 7440-66-6 Zinc 8.1 P U P 7440-66-6 Zinc 8.1 P U P 7440-66-6 Zinc Reference CLEAR Artifacts:		7440-39-3	Barium	590	F	-
7440-43-9 Cadmium		7440-41-7	- 			<u>:</u>
T440-47-3 Chromium		7440-43-9	· 	0.40	J P	
T440-48-4 Cobalt 0.40	1	7440-70-2	Calcium	98100	P	
T440-50-8 Copper 0.80 U P T439-89-6 Iron 11000 P P T439-92-1 Lead 1.3 V U P T439-95-4 Magnesium 32500 P P T439-96-5 Manganese 68.2 P P T439-97-6 Mercury 0.10 U CV T440-02-0 Nickel 0.72 V J P T782-49-2 Selenium 15400 P P T782-49-2 Selenium 1.7 V U J P T740-22-4 Silver 0.50 V U J P T740-23-5 Sodium 31900 V J P T740-62-2 Vanadium 0.30 V U J P T7440-62-2 Vanadium 0.30 V U P T7440-66-6 Zinc S.1 P U P T7440-66-6 Zinc S.1 P U P T7440-66-6 Zinc S.1 P U P T7440-66-6 Zinc S.1 P U P T7440-66-6 Zinc S.1 P U P T7440-66-6 Zinc S.1 P U P T7440-66-6 Zinc S.1 P U P T7440-66-6 Zinc S.1 P U P T7440-66-6 Zinc S.1 P U P ZINC ZIN		7440-47-3	Chromium	0.40	PIUTIP	14
T440-50-8 Copper		7440-48-4	Cobalt	0.40	Y UT P	70/
T439-92-1		7440-50-8	Copper	0.80		Ī <u>*</u>
7439-95-4 Magnesium 32500 P		7439-89-6	Iron	11000	P	7
7439-96-5 Manganese 68.2 P		7439-92-1	Lead	1.3	WJIP	<u> </u>
7439-97-6 Mercury 0.10 U CV 7440-02-0 Nickel 0.72 P J P		7439-95-4	Magnesium	32500	P	Ţi /
7440-02-0 Nickel 0.72		7439-96-5	Manganese	68.2	P	7 /
7440-09-7		7439-97-6	Mercury	0.10	1 0	7]
7782-49-2 Selenium		7440-02-0	Nickel	0.72	7 J P] \
7440-22-4 Silver		7440-09-7	Potassium	15400	P] \
7440-23-5 Sodium 31900		7782-49-2	Selenium	1.7	IUJ I P] \
7440-28-0 Thallium 4.2 U P 7440-62-2 Vanadium 0.30 V UJ P 7440-66-6 Zinc 8.1 P U P 2 Color Before: COLORLESS Clarity Before: CLEAR Texture: Color After: COLORLESS Clarity After: CLEAR Artifacts:		7440-22-4	Silver	0.50	IUJ IP] g
7440-62-2 Vanadium 0.30 V U P V		7440-23-5	Sodium	31900	V JIP	_1'\gamma_
Color Before: COLORLESS Clarity Before: CLEAR Texture: Color After: COLORLESS Clarity After: CLEAR Artifacts:		7440-28-0	Thallium	4.2 0	P	7
Color Before: COLORLESS Clarity Before: CLEAR Texture: Color After: COLORLESS Clarity After: CLEAR Artifacts:		7440-62-2	Vanadium	0.30	IUJ P	
Color Before: COLORLESS Clarity Before: CLEAR Texture: Color After: COLORLESS Clarity After: CLEAR Artifacts:		7440-66-6	Zinc	8.1	U P	8
Color After: COLORLESS Clarity After: CLEAR Artifacts:						_ 0
Color After: COLORLESS Clarity After: CLEAR Artifacts:	·					
Color After: COLORLESS Clarity After: CLEAR Artifacts:						
Color After: COLORLESS Clarity After: CLEAR Artifacts:					•	
Color After: COLORLESS Clarity After: CLEAR Artifacts:						
	Color Before: COI	CORLESS C1	arity Before:	CLEAR	Texture:	
	Talam Aftaur Cot	OBTEGG		CIPAD	Amti 64-:	
	Lolor Arter: COI	ORLESS CI	arity After:	CLEAR	Artifacts:	
	•					
Comments:	Comments:					
	***************************************		<u> </u>			
						

INORGANIC ANALYSES DATA SHEET

Lab Code: LIBE		, S	AS No.:		SDG 1		RW1067
atrix (soil/wa	· · · · · ·	 	Lab Sample I	D:	RW10		
evel (low/med)	: LOW		Date Receive	d:	9/19	/02	
Solids: 0.0							
							
	Concentr	cation Units (ug/	L or mg/kg dry	weig	jht):	UG/	L
	CAS No.	Analyte	Concentration	С	Q	М	
	7429-90-5	Aluminum	2410	╁		P	i w
	7440-36-0	Antimony	1.7	ָ טן	<u> </u>	P	<u> </u>
	7440-38-2	Arsenic	135	i		P	i 0
	7440-39-3	Barium	311	i		P	i \
	7440-41-7	Beryllium	0.28	B	U	P	i l
	7440-43-9	Cadmium	0.40	Įυ		P	ī /
	7440-70-2	Calcium	137000			P	ī
	7440-47-3	Chromium	8.0	13/		P	īl
	7440-48-4	Cobalt	3.1	19,		P	1
	7440-50-8	Copper	18.9	F		P	Z, [
	7439-89-6	Iron	18200			P	ĪÆ
	7439-92-1	Lead	30.3			P] ×
	7439-95-4	Magnesium	87200		•	P	Ī
	7439-96-5	Manganese	278	1 1		P	1
	7439-97-6	Mercury	0.10	la l		CV	1 (
	7440-02-0	Nickel	11.5		\mathcal{J}	P	<u> </u>
	7440-09-7	Potassium	27400			P	<u> </u>
	7782-49-2	Selenium	1.7	المحر	UJ	P	<u> </u>
	7440-22-4	Silver	0.50	المرا	UJ	P	îÉ
	7440-23-5	Sodium	112000		FJ	P	1 1/2
	7440-28-0	Thallium	<u> </u>	la l		P	1,3
	7440-62-2	Vanadium	5.6	P		P	caeuxs
	7440-66-6	Zinc	80.8	1 1		P	

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INORGANIC ANALYSES DATA SHEET

	PUCHEM	Contr	 		[MB- Ca	9 GW02PB E 11/7/02 RW1067
ab Code: LIBI	Case N	o.: SA	AS No.:		SDG N	lo . ː ˆ	RW1067
trix (soil/wa	ater): WATER		Lab Sample I	D:	RW106	7-2	
vel (low/med)): LOW		Date Receive	d:	9/19/	02	
Solids: 0.0							
	Concent	ration Units (ug/	L or mg/kg dry	weig	ght):	UG/I	L
	CAS No.	Analyte	Concentration	С	Q	м	Ī
	7429-90-5	Aluminum	36.7	19/	u	P	ĺ
	7440-36-0	Antimony	1.7	ĮŪ		P	i l
	7440-38-2	Arsenic	10.4	1	J	P	i
	7440-39-3	Barium	66.9	19/	<u> </u>	P	Ī
	7440-41-7	Beryllium		U		P	Ī
	7440-43-9	Cadmium	0.40	U		P	j (
	7440-70-2	Calcium	57700			P	1
	7440-47-3	Chromium	0.40	17	UJ	P	اً
	7440-48-4	Cobalt	0.40	17	UJ	P	10
	7440-50-8	Copper	0.80	N	UJ	P	14
	7439-89-6	Iron	2080			P	<u> </u>
	7439-92-1	Lead	1.3	y	UJ	P	1
	7439-95-4	Magnesium	20700			P	1
	7439-96-5	Manganese	505			P	
	7439-97-6	Mercury	•	U		CV	
	7440-02-0	Nickel	0.60	N N	UJ	P	
	7440-09-7	Potassium	1620	P		P	
	7782-49-2	Selenium	1.7	<u> </u>	UJ	P	3
	7440-22-4	Silver	0.50		UJ	P	7,20x
	7440-23-5	Sodium	8600		X J	P	**
	7440-28-0	Thallium	<u> </u>	U		P	1,2
	7440-62-2	Vanadium		.,	UJ	P	Cataix
	7440-66-6	Zinc	3.1	F	<u>u</u>	P	0

INORGANIC ANALYSES DATA SHEET

Lab Name: COMPUCI ab Code: LIBRTY Matrix (soil/wate evel (low/med): Solids: 0.0	Case No.	: S	ract: AS No.: Lab Sample II Date Received Lack received Lack received	D: R	M1067-1 /19/02	•
evel (low/med):	LOW Concentra	tion Units (ug/	Date Received	d: <u>9</u>	/19/02	•
evel (low/med):	LOW Concentra	tion Units (ug/	Date Received	d: <u>9</u>	/19/02	•
	Concentra	tion Units (ug/		_		
Solids: 0.0		tion Units (ug/	'L or mg/kg dry v	weigh	t): UG,	
		tion Units (ug/	L or mg/kg dry v	weigh	t): UG,	
		tion Units (ug/	L or mg/kg dry v	werdu.	t): UG/	
	CAS No.				_	
		Analyte	Concentration	c	Q M	7
	[<u> </u>	 	<u>L.</u>		_ W
	7429-90-5	Aluminum		FU		2
	7440-36-0	Antimony		19/10		- 1
	7440-38-2	Arsenic	_ 	U	P	-{)
	7440-39-3	Barium		B	P	
	7440-41-7	Beryllium Cadmium		ן ען טן	P	-{ \
	7440-70-2	Calcium	111000		P	۲ ۲
	7440-47-3	Chromium		1 1	1.T P	-13
	7440-48-4	Cobalt		V 11	IT P	- W
	7440-50-8	Copper			ITIP	- ≥ `
	7439-89-6	Iron		<u> </u>	11 P	i \
	7439-92-1	Lead		W I	ITIP	i
	7439-95-4	Magnesium	34300		P	-i /
	7439-96-5	Manganese		BIV		i 1
	7439-97-6	Mercury	<u></u>	U	cv	i /
	7440-02-0	Nickel	0.60	VIU	J P	i \
	7440-09-7	Potassium	2740	FI	P	Ī `
	7782-49-2	Selenium	1.7	y Iu	JIP	ر آ
	7440-22-4	Silver	0.50	V11		Ī ,
	7440-23-5	Sodium	11800	P	J P	17,
	7440-28-0	Thallium	<u> . </u>	ן ט	P	[3
	7440-62-2	Vanadium	0.30	ylu	JIP	182
	7440-66-6	Zinc	6.4	7 1 U	(P	[8

INORGANIC ANALYSES DATA SHEET

Lab Name:	COMPUCHEN	M	Cont	ract:		GWO9FBPB Field Bloak
Lab Code:	LIBRTY	Case N	o.:SI	AS No.:	SDG	No.: RW1067
_ Matrix (soi	1/water)	: WATER		Lab Sample I		67-10
evel (low/		LOW		Date Receive		
_	•	<u> </u>		Date Receive	u. <u>3/13</u>	702
% Solids:	0.0					
_	•	Concent	ration Units (ug/	Lor mg/kg dry	weight):	UG/L
•		CAS No.	Analyte	Concentration	C Q	MW
_	[7429-90-5	Aluminum	141	FU	I B &
	Ĺ	7440-36-0	Antimony	2.5	PI J	' P I
	. [7440-38-2	Arsenic	_ 	Ισ	P
_	Į.	7440-39-3	Barium		BIU	P
	[7440-41-7	Beryllium	_ !	la l	P
	ĺ	7440-43-9	Cadmium	_'	la l	P
	ĺ	7440-70-2	Calcium		المحل	P N
	Į	7440-47-3	Chromium	l .	ly WJ	P 0
_	<u> </u>	7440-48-4	Cobalt		IY IUJ	P W
	Į	7440-50-8	Copper		ドI J	P
	ļ	7439-89-6	Iron	<u> </u>	n	P
-	<u>l</u>	7439-92-1	Lead	1.3	V I UJ	P
	Ţ	7439-95-4	Magnesium		PU	P
	ļ	7439-96-5	Manganese	<u></u>	19/1U	P
_	Ţ	7439-97-6	Mercury	0.10	U	cv :
	Ţ	7440-02-0	Nickel	-!	WILL	P
	Į	7440-09-7	Potassium	67.1	V UJ	P
_	Ţ	7782-49-2	Selenium	1.7	UJ	P S
	Ţ	7440-22-4	Silver	. •	UUJ	P
_	Ĺ	7440-23-5	Sodium		B/FJ	P
		7440-28-0	Thallium	<u> </u>	U	Z 9 9
	<u> </u>	7440-62-2	Vanadium		Z UJ	W q
_	Ĺ	7440-66-6	Zinc	10.2	R	P
-						
_ Color Befo	ore: COLO	RLESS	Clarity Before:	CLEAR	Texture	e:
Color Afte	er: COLO	RLESS	Clarity After:	CLEAR	Artifac	ets:
Comments:						
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DATA VALIDATION

FOR

MARION BRAGG LANDFILL MARION, INDIANA

INORGANIC ANALYSIS DATA Dissolved Metals in Water

SDG No. RU1067 Samples Collected September 2002

Chemical Analyses Performed by:

CompuChem Environmental Cary, North Carolina

FOR

O & M, Inc. Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

November 12, 2002

92241/CAE/EKD MARION\Sept02\DMetals1



EXECUTIVE SUMMARY

Validation of the inorganics analysis data (dissolved metals) prepared by CompuChem Environmental for five surface water samples from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single separate data package under Sample Delivery Group (SDG) No. RU1067, which was received for review on April 2, 2002, with additional documentation provided on October 28, 2002, and November 11, 2002. The following samples were reported:

PW01PB (PW-1)	SW01PB (SW-1)	SW01DPPB (SW-1D)
SW02PB (SW-5)	SW03PB (SW-6)	

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for nickel in PW01PB and SW03PB were qualified as less than the reported values (U).
- Results for zinc in PW01PB, SW01PB, SW02PB, and SW03PB were qualified as estimated (J, UJ).
- The result for selenium in SW01PB was qualified as less than the reported value (U).
- Results for vanadium in PW01PB, SW01DPPB, SW02PB, and SW03PB were qualified as estimated (J, UJ).
- Results for antimony, chromium, and cobalt in SW01PB were qualified as less than the contract required detection limits (60.0 U, 10.0 U, and 50.0 U, respectively).
- Results for barium and potassium in all samples were qualified as estimated (J).
- Results for arsenic, copper, nickel, and vanadium in SW01PB and SW01DPPB were qualified as estimated (J).
- The result for zinc in SW01DPPB was qualified as less than the contract required detection limit (20.0 U).
- Results for arsenic in PW01PB and SW02PB were qualified as estimated (J).
- Results for chromium, copper, and nickel in SW02PB were qualified as estimated (J).
- The result for copper in SW03PB was qualified as estimated (J).



All "B" and "E" flags applied by the laboratory were removed by the validator.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIII). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XII of this report.

This validation report should be considered <u>part of the data package</u> for all future distributions of the inorganics data.



INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work ILM04.0. All target analytes (dissolved metals) were analyzed using trace ICP (inductively coupled plasma) and cold vapor atomic absorption (CVAA) instrumentation. Results of analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes denote specific information regarding the analytical results.

Trillium's validation was performed in accordance with the EPA "National Functional Guidelines for Inorganic Data Review" (EPA 540/R-94/013, 2/94). The EPA Region II Standard Operating Procedure (SOP) No. HW-2, (Revision XI), January 1992, "Evaluation of Metals Data for the Contract Laboratory Program (CLP)" was also used as guidance for the validation effort, and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the review, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes as defined by the National Functional Guidelines:

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- R The data are unusable. (Note: The analyte may or may not be present.)
- J The associated value is an estimated quantity.
- UJ The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables contained in Attachment A as well as on the Inorganic Analysis Data Sheets (Form Is) in Attachment B of this validation report to qualify the results as appropriate according to the review of the data packages.



Two facts should be noted by all data users. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.



I. Holding Times, Preservation and Sample Integrity

The surface water samples were collected on 9/17/02. All metals analyses were conducted on 10/1/02, which is well within acceptable holding times (28 days for mercury and six months for all other analytes).

Field filtration of the surface water samples for dissolved metals analysis was not clearly documented by the sampling team on the applicable chain of custody (COC) record. A "B" (for "both") was recorded in the COC field used to designate filtered or unfiltered; no clarification of what was filtered and unfiltered was documented. For the purposes of this validation effort, it was assumed that the appropriate sample containers for dissolved metals analysis were field-filtered prior to chemical preservation.

Chemical preservation of the samples for dissolved metals analysis with nitric acid and ice was clearly documented on the COC. Acceptable cooler temperatures (4-6°C) on laboratory receipt were recorded on the COC and on the laboratory's receiving log. Acceptable sample pHs (<2) were not documented on the COC but were recorded on the applicable receiving and preparation logs. Therefore, successful sample preservation in the field was confirmed.

According to the narrative in the data package, all samples were received intact and in good condition.

II. Calibrations

Sample analyses for all Trace ICP target elements were performed in a single analysis series on 10/1/02 on an instrument identified as "P3." Mercury analyses were performed in a single CVAA series run on 10/1/02 on an instrument identified as "V3." A linearity check at the start of the CVAA series gave an acceptable correlation coefficient (>0.995). Initial and continuing calibration verification (ICV/CCV) standards were satisfactory for all metals reported from both applicable analysis series (90-110% for all ICP target analytes and 80-120% for mercury).

Contract required detection limit (CRDL) standards were run at regular intervals throughout the ICP analysis series; all applicable analytes were at the required concentrations (2xCRDL). Recoveries were acceptable (80-120%) for all analytes in all CRDL standards.

A CRDL standard was also run at the start of the analysis series for mercury. The recovery for mercury in this standard (95.0%) was acceptable.



III. Blanks

No metals calibration blanks had values above the CRDLs or less than the negative CRDLs for any target element. However, responses above the applicable instrument detection limits (IDLs) were found for various combinations of 14 different elements (barium, beryllium, cadmium, calcium, chromium, cobalt, iron, lead, magnesium, nickel, potassium, sodium, thallium, and vanadium) in each of the initial and continuing calibration blanks (ICB/CCBs); in addition, results for one or more of four elements (calcium, copper, sodium, and zinc) that were below the negative IDLs were also reported in each of the ICB/CCBs. Results for samples analyzed within five runs of an affected ICB/CCB warrant qualification if the sample result is less than five times the positive blank value or less than two times the absolute value of the negative blank response. Results for nickel in PW01PB and SW03PB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.

Results for zinc in PW01PB, SW01PB, SW02PB, and SW03PB were qualified as estimated (J, UJ) based on negative responses in the associated calibration blanks.

Sample results for all remaining elements for which positive or negative responses were found in the ICB/CCBs were not affected by the associated calibration blank values.

One preparation blank (PBW) was prepared and analyzed with the samples in this SDG. Responses for calcium (-52.37 μ g/L), selenium (3.01 μ g/L), vanadium (-0.42 μ g/L), and zinc (-2.74 μ g/L) were reported in the preparation blank. All sample results for calcium were greater than the action limit for qualification based on this blank response, therefore no sample results for calcium were qualified on this basis. The result for selenium in SW01PB was qualified as less than the reported value (U) due to the associated PBW contamination. Results for vanadium in PW01PB, SW01PPB, SW02PB, and SW03PB and for zinc in PW01PB, SW01PB, SW02PB, and SW03PB were qualified as estimated (J, UJ) based on negative responses in the associated PBW.

Some of the actions warranted based on PBW responses are redundant with actions taken based on CCB results; no additional action was taken in these cases.

No field-submitted blanks were associated with these samples.

IV. ICP Interference Check Sample

All interference check sample results were satisfactory (80-120 percent recovery).



V. Laboratory Control Sample

One laboratory control sample (LCS) was run for all ICP target analytes in association with this SDG. All laboratory control sample results for the ICP target analytes were satisfactory (80-120 percent recovery).

Based on the available documentation, no LCS samples were prepared or analyzed for mercury.

VI. Laboratory Duplicate Analysis

Duplicate analysis was performed on sample SW01PB for all target analytes. Relative percent differences (RPDs) between positive paired analytes in SW01PB and its duplicate were below the maximum acceptance limit of 20% for all elements detected at concentrations greater than five times the CRDL. For elements detected at concentrations less than five times the CRDL in the paired analyses, the difference between the paired results must be less than ±CRDL. This criterion was met for all applicable target analytes.

Positive results below the CRDL for antimony (2.2 µg/L), chromium (0.86 µg/L), and cobalt (1.9 µg/L) were reported in the original analysis of SW01PB but were not confirmed in the duplicate analysis (1.6 U, 0.60 U, and 0.40 U), respectively). Antimony, chromium, and cobalt were also not detected in the field duplicate of SW01PB (SW01DPPB; see Section IX). Based on professional judgment, results for antimony, chromium, and cobalt in SW01PB were qualified as less than the CRDLs (60.0 U, 10.0 U, and 50.0 U, respectively) due to lack of confirmation in the laboratory duplicate analyses.

VII. Matrix Spike Analysis

Matrix spike analysis was performed on sample SW01PB with acceptable recoveries (75-125%) for all target elements.

VIII. ICP Serial Dilution

Serial dilution analysis was performed on samples SW01PB. Results for elements with initial (undiluted) results greater than 50xIDL were acceptable (less than 10 percent difference) except for barium (10.4%) and potassium (28.0%). Results for barium and potassium in all samples were qualified as estimated (J) based on these serial dilution results.



The "E" flags appropriately applied by the laboratory to all of the positive site sample results for potassium were removed by the validator.

IX. Field Duplicates

Sample SW01DPPB was identified as a field duplicate of SW01PB. RPDs between positive paired results were acceptable (QAPP QC ≤25 RPD) for barium (8.3 RPD), calcium (0.2 RPD), magnesium (0.8 RPD), manganese (5.0 RPD), potassium (0.9 RPD), and sodium (0.4 RPD), but exceeded the QAPP-specified acceptance limit for arsenic (32 RPD), copper (64 RPD), nickel (32 RPD) and vanadium (114 RPD). Results for arsenic, copper, nickel, and vanadium in SW01PB and SW01DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.

Positive results below the CRDLs for antimony (2.2 μ g/L), chromium (0.86 μ g/L), and cobalt (1.9 μ g/L) were reported in SW01PB but were not confirmed in SW01DPPB (1.6 U, 0.60 U, and 0.40 U, respectively). Similarly, a result below the CRDL for zinc (15.9 μ g/L) was reported in SW01DPPB but was not confirmed in SW01PB (0.70 U). Based on professional judgment, results for antimony, chromium, and cobalt in SW01PB and for zinc in SW01DPPB were qualified as less than the CRDLs (60.0 U, 10.0 U, 50.0 U, and 20.0 U, respectively) due to the lack of field duplicate confirmation.

X. Sample Results Verification

Positive sample results were accurately reported from the raw data and IDLs established within three months prior to these sample analyses (on 7/15/02 for all ICP elements on P3 and for mercury on V3) were appropriately reported for those elements that were not detected.

Elevated %RSDs (>20%) among the triplicate measurements taken for each element in each run were found for numerous elements reported at concentrations below the applicable CRDLs. Many of these results were subsequently qualified as less than the reported values due to associated blank contamination or as less than the CRDL due to lack of laboratory or field duplicate confirmation, or as estimated for reasons previously discussed; no additional action was necessary in these cases. Those sample results that were not so qualified were qualified by the validator as estimated (J) due to the high %RSDs; these values must be considered estimates based on the inconsistent responses obtained at the measured concentrations. The following results were qualified on this basis:

- Arsenic in PW01PB (27.5%) and SW02PB (99.3%).
- Chromium (41.8%), copper (65.5%), and nickel (38.1%) in SW02PB.



Positive sample results greater than the applicable IDLs but below the CRDLs were correctly reported by the laboratory with "B" qualifiers. As concentrations approach the IDL the accuracy of the measurement decreases; values closer to the CRDL, however, are probably quite accurate. Therefore, a guideline of 2xIDL was used to determine whether the reported results warranted qualification; specifically, sample results below the respective CRDL, less than 2xIDL and not otherwise qualified warrant qualification as estimated (J). The result for copper in SW03PB was so qualified on this basis.

All "B" qualifiers applied by the laboratory were removed by the validator.

XI. Other QC

Total metals analyses were not performed on these samples.

XII. Documentation

The applicable chain of custody (COC) record was present in the data package. The following issues were noted:

- Sample PW01PB was not recorded by the sampler on the COC. An appropriate notation to this effect was made by the laboratory on the COC.
- Despite a specific request on the COC, sample pHs on laboratory receipt were not recorded on the COC.
- A copy of the courier airbill was not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on the COC record.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should <u>not</u> be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are <u>laboratory-initiated quality control</u>; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

Laboratory receiving logs (for SDG No. RU1067 and SDG No. RW1067) in the data package received for review did not include any sample pH values measured on receipt at the laboratory. At



the validator's request, corrected receiving logs were provided by the laboratory via facsimile on 10/31/02. Both corrected records showed acceptable pH values for the dissolved metals samples (pH<2 in all cases). The corrected log for SDG No. RU1067 was also correct for the ammonia samples, but the corrected log for SDG No. RW1067 was incorrect for the ammonia samples (see the wet chemistry validation report for further information). The laboratory was contacted a second time by the validator and a second corrected receiving log for SDG No. RW1067 was provided via UPS on 11/11/02. The two final corrected documents were inserted into the data package for SDG #RU1067 as pages 134-135 by the validator, replacing the originally-provided pages.

These COC documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XIII. Overall Assessment

Based on the validation effort, dissolved metals results for samples in SDG No. RU1067 and were qualified as follows:

- Results for nickel in PW01PB and SW03PB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.
- Results for zinc in PW01PB, SW01PB, SW02PB, and SW03PB were qualified as estimated (J, UJ) based on negative responses in the associated calibration and preparation blanks.
- The result for selenium in SW01PB was qualified as less than the reported value (U) due to contamination in the associated preparation blank.
- Results for vanadium in PW01PB, SW01DPPB, SW02PB, and SW03PB were qualified as estimated (J, UJ) based on negative responses in the associated preparation blank.
- Results for antimony, chromium, and cobalt in SW01PB were qualified as less than the CRDLs (60.0 U, 10.0 U, and 50.0 U, respectively) based on lack of confirmation in the laboratory and field duplicate analyses and professional judgment.
- Results for barium and potassium in all samples were qualified as estimated (J) based on unacceptable serial dilution results.
- Results for arsenic, copper, nickel, and vanadium in SW01PB and SW01DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.



- The result for zinc in SW01DPPB was qualified as less than the CRDL (20.0 U) based on lack of field duplicate confirmation and professional judgment.
- Results for arsenic in PW01PB and SW02PB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.
- Results for chromium, copper, and nickel in SW02PB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.
- The result for copper in SW03PB was qualified as estimated (J) because it was less than 2xIDL and was not otherwise qualified.

All "B" and "E" flags applied by the laboratory were removed by the validator.

Documentation issues observed in the data package are discussed in Section XII.

This validation report should be considered <u>part of the data package</u> for all future distributions of the inorganics data.



ATTACHMENT A

DATA TABLE SDG No. RU1067 Dissolved Metals in Water

Marion Bragg Landfill - September 2001 - Dissolved Metals in Surface Water Samples

All Results are in ug/L

All Kesuits C	are in ug/L										
Collection Po		PW-1		SW-1		SW-1D	_	SW-5		SW-6	
Sample ID ==		PW01PB		SW01PB		SW01DPF		SW02PE		SW03PE	
Lab Sample 1		RU1067-	5	RU1067-	1	RU1067-	2	RU1067-		RU1067-	1
Collection Da		9/17/02		9/17/02		9/17/02		9/17/02		9/17/02	
	CRDL										
Aluminum	200	57.7		57.7		57.7		57.7		57.7	
Antimony	60	1.6		60.0		1.6		1.6		1.6	
Arsenic	10	3.3		2.9		2.1		1.5		1.3	U
Barium	200	104		108	J	99.4	J	97.6	J	69.7	J
Beryllium	5	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
Cadmium	5	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
Calcium	5000	35700		85400		85200		84000		98900	
Chromium	10	0.60	U	10.0	U	0.60	U	0.78	J	0.60	U
Cobalt	50	0.40	U	50.0	U	0.40	U	0.40	U	0.40	U
Copper	25	0.60	U	2.9	J	1.5	J	1.3	J	1.1	J
Iron	100	8.7	U	8.7	U	8.7	U	8.7	U	8.7	U
Lead	3	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U
Magnesium	5000	30100		36600		36300		35300		42900	
Manganese	15	0.50	U	12.2		11.6		8.8		46.9	
Mercury	0.2	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U
Nickel	40	1.9	U	2.9	J	2.1	J	1.1	J	0.80	U
Potassium	5000	4410	J	3400	J	3370	J	3230	J	2450	J
Selenium	5	2.9	U	3.6	U	2.9	U	2.9	U	2.9	IJ
Silver	10	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U
Sodium	5000	18100		44100		43900		42900		24700	
Thallium	10	2.6	U	2.6	U	2.6	U	2.6	U	2.6	U
Vanadium	50	0.40	UJ	2.9	J	0.79	J	0.40	UJ	0.40	UJ
Zinc	20	0.70	UJ	0.70	UJ	20.0	U	2.5	J	0.70	UJ



ATTACHMENT B

INORGANIC ANALYSIS DATA SHEETS (Form Is)
SDG No. RU1067
Dissolved Metals in Water

INORGANIC ANALYSES DATA SHEET

Lab Name: COMPUCHE ab Code: LIBRTY	Case No.:	Contr	S No.:		SDG N	PW.	
- Matrix (soil/water)	: WATER		Lab Sample I	D:	RU106	7-5	
evel (low/med):	row		Date Receive		9/19/		
_							
Solids: 0.0	-						
-	Concentrat	ion Units (ug/	L or mg/kg dry	wei	ght):	UG/	L —
	CAS No.	Analyte	Concentration	С	Q	М]
-	7429-90-5	Aluminum	57.7	U	 	P	jw)
	7440-36-0	Antimony	1.6	U	T	P	13
_	7440-38-2	Arsenic	3.3	18	IJ	P	1
	7440-39-3	Barium	104	Þ	KJ	P]
	7440-41-7	Beryllium	0.20	U	1	P]
-	7440-43-9	Cadmium	0.20	Ju	<u> </u>	P	<u> </u>
	7440-70-2	Calcium	35700	1_	<u> </u>	P	1 \
	7440-47-3	Chromium		U	<u>!</u> _	P	\
•	7440-48-4	Cobalt	0.40	U	<u> </u>	P	4
	7440-50-8	Copper		U	<u> </u>	P	6
	7439-89-6	Iron	 	U	<u>[</u> _	P	, M
-	7439-92-1	Lead		lu 1	 	P	`
	7439-95-4	Magnesium	30100	177	 	P	!)
	7439-96-5	Manganese	!	U	1	P	
	7439-97-6	Mercury	0.10	lb.	1	CV	
	7440-02-0 7440-09-7	Nickel	1.9	<u> </u>	IV T	P	\
. }	7782-49-2	Potassium Selenium	4410	₽ U	\$ J	P	İ
ļ	7440-22-4	Silver		U	1	P	<u>ا</u> ک
) 	7440-22-4	Sodium	18100	1	<u> </u>	P	5
	7440-28-0	Thallium	2.6	<u> </u> U	<u> </u>	P	N N
ļ ļ	7440-62-2	Vanadium	0.40	100	UJ	P	E.
1	7440-66-6	Zinc	0.70	<u> /</u>	IUJ	P	
·				<i>Y</i>	140	1	, Car
. Color Before: COLO	DRLESS C1	arity Before:	CLEAR	Te	exture:	: .	
Color After: COLO	ORLESS C1	arity After:	CLEAR	A	rtifact	ts:	
-							

INORGANIC ANALYSES DATA SHEET

- Lab Name: (COMPUCHEM	Cont	cract:			.5W	SW01PB
Lab Code: I			SAS No.:		SDG N	Q	ae 11 7 102 RUI 067
		No			SDG N	10	R01087
Matrix (soil	l/water): WATER		Lab Sample I	D:	RU106	7-1	
evel (low/	med): LOW		Date Receive	ed:	9/19/	02	
- % Solids: 0	0.0						
							•
-	Concen	tration Units (ug	/L or mg/kg dry	weig	ht):	UG/	<u>L</u>
	CAS No.	Analyte	Concentration	С	Q	М	
-	7429-90-	5 Aluminum	57.7	U		P	18
	7440-36-0	O Antimony	40.0 2.2	B	u	P	Ī ,
	7440-38-2	2 Arsenic	2.9	N I	J_	P	1 \
-	7440-39-3	3 Barium	108		足丁	P	1
	7440-41-	7 Beryllium	0.20	[U]		P	1
_	7440-43-9	9 Cadmium	0.20	n		P	1
	7440-70-2	2 Calcium	85400	1 1		P	1
	7440-47-3		1 10.0 0.86	<u> </u>	<u>u</u>	P	<u> </u>
	7440-48-4	Cobalt	50.0 1.9		<u>u_</u>	P	1
	7440-50-8	3 Copper	2.9	1 A	\mathcal{J}_{-}	P	1 6
	7439-89-6	!	8.7	U		P	<u> </u>
	7439-92-1		_ 	U		P	<u> </u> ≥
	7439-95-4	!	36600	1 1		P	! ,
	7439-96-5		'	17/		P	!
	7439-97-6			10 1		CV]
	7440-02-0			19 1	$\frac{\mathcal{J}}{\mathcal{T}}$	J P	} {
	7440-09-7		_ 		¥J.	P	! \
	7782-49-2		'	DY	<u>u</u>	P	اي
	7440-22-4			U		P	6
	7440-23-5		44100			P	12
	7440-28-0		<u></u>	U	7	P	E
	7440-62-2			 	J	P	
	7440-66-6	Zinc	0.70	10	UJ	P	a.
							1
Color Befo	re: COLORLESS	Clarity Before:	CLEAR	Te	xture:	: .	
Color Afte	r: COLORLESS	Clarity After:	CLEAR	Ar	tifact	ts:	· · · · · · · · · · · · · · · · · · ·
Comments:	DISSOLVED			 .	<u>-</u> _		
							()(: 11

INORGANIC ANALYSES DATA SHEET

Contract:

Lab Name: COMPUCHEM

EPA SAMPLE NO.

SW-ID SW01DPPB

Lab Code: LII	BRTY Case No.	: :	S No.:		EDG No.	CaE 117/02 RU1067
- Matrix (soil/	water): WATER		Lab Sample II	D: F	RU1067-	2
Level (low/me			Date Received	-	0/19/02	-
_			2002 10002100	-· <u>-</u>	7 137 02	
* Solids: 0.0	<u> </u>					
-	Concentra	tion Units (ug/	L or mg/kg dry w	weigh	t): <u>U</u>	G/L
	CAS No.	Analyte	Concentration	С	Q A	ī
-	7429-90-5	Aluminum	57.7	U	I	\supseteq ω
	7440-36-0	Antimony	1.6	ן טן	I	
	7440-38-2	Arsenic	2.1	19/1.	JI	
-	7440-39-3	Barium	99.4	IF IF	111	,]
	7440-41-7	Beryllium	0.20	U	E	·
_	7440-43-9	Cadmium	0.20	U I	E	·
_	7440-70-2	Calcium	85200	11	E	· ī \
	7440-47-3	Chromium	0.60	ן ט	E	·
_	7440-48-4	Cobalt	0.40	U	F	<u>.</u>
	7440-50-8	Copper	1.5	17 1	T F	
	7439-89-6	Iron	8.7	U	F	7
-	7439-92-1	Lead	0.70	U	P	·
	7439-95-4	Magnesium	36300		P	·
	7439-96-5	Manganese	11.6	BI	P	- T
-	7439-97-6	Mercury	0.10	U	10	71
	7440-02-0	Nickel	2.1	19/1.	T P	71
	7440-09-7	Potassium	3370	P	TIP	<u> </u>
•	7782-49-2	Selenium	2.9	Ū	P	1
	7440-22-4	Silver	0.70	U	P	7
	7440-23-5	Sodium	43900		P	
-	7440-28-0	Thallium	2.6	U	P	1,4%
	7440-62-2	Vanadium	0.79	F 1.	JIP	3
	7440-66-6	Zinc		B	UIP	$\exists \mathbf{a}$
- -						-0
Color Before	: COLORLESS C	larity Before:	CLEAR	Tex	ture:	
Color After:	COLORLESS C	larity After:	CLEAR	Art	ifacts:	
Comments:	DISSOLVED					
_						
			1		·	(((10

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

ab Code: LIBRT	CHEM Y Case No	Contr	act:		l_ SDG N	Ç.	1-5 SW02P
trix (soil/wat	,		Lab Sample I	n ·	RU106		
evel (low/med):			Date Receive		9/19/		
	LON		Date Receive	u.	3/13/	02	
Solids: 0.0							
	Concentr	ation Units (ug/	L or mg/kg dry	wei	ght):	UG/	L
	CAS No.	Analyte	Concentration	С	Q	М	
	7429-90-5	Aluminum	57.7	U	1	P	8
	7440-36-0	Antimony	1.6	U	1	P	10
	7440-38-2	Arsenic	1.5	/R	IJ	P	ī \
	7440-39-3	Barium	97.6	B	IFJ	P	Ī
	7440-41-7	Beryllium	0.20	U	1	P	Ī
	7440-43-9	Cadmium	0.20	טן		P]
	7440-70-2	Calcium	84000	Ī		P] \
	7440-47-3	Chromium	0.78	B	IJ	P	14
	7440-48-4	Cobalt	0.40	U		P	100
	7440-50-8	Copper	1.3	B	IJ	P	<u> </u>
	7439-89-6	Iron	1 8.7	U	1	P	1
	7439-92-1	Lead	0.70	Մ	1	P	1 1
	7439-95-4	Magnesium	35300	Ī	[P	1
	7439-96-5	Manganese	8.8	13	<u> </u>	P	Ī [
	7439-97-6	Mercury	0.10	U		cv	Ī
	7440-02-0	Nickel	1.1	B	IJ	P	Ī
	7440-09-7	Potassium	3230	18	EJ.	P	j \
	7782-49-2	Selenium	2.9	U		P	ĺ,
	7440-22-4	Silver	0.70	U		P	ĺΚ
	7440-23-5	Sodium	42900	Ĩ		P	× 8
•	7440-28-0	Thallium	2.6	U		P	1 , ~
	7440-62-2	Vanadium	0.40	ممتا	UJ	P	\mathcal{Z}
	7440-66-6	Zinc	2.5	137	J	P	B

INORGANIC ANALYSES DATA SHEET

ah Manay COMP	IODEN A				SW-	SW03PB
ab Name: COMPU		Conti				RU1067
ab Code: LIBRT	Y Case No.	: Si	AS No.:	SI	DG No. :	RU1067
atrix (soil/wat	er): WATER		Lab Sample I	D: <u>R</u>	U1067-4	
evel (low/med):	LOW		Date Receive	d: 9,	/19/02	
Solids: 0.0				-		
<u>0.0</u>						•
	Concentra	tion Units (ug/	L or mg/kg dry	weight	:): UG/	L
						
	CAS No.	Analyte	Concentration	С	Q M	$ _{\omega}$
	7429-90-5	Aluminum	57.7	U	P	3
	7440-36-0	Antimony	1.6	lo l	P	10
	7440-38-2	Arsenic	1.3	U	P	Ī /
	7440-39-3	Barium	69.7	PP	JIP	Ţ (
	7440-41-7	Beryllium	0,20	U	P	Īλ
	7440-43-9	Cadmium	0.20	la l	P	
	7440-70-2	Calcium	98900		P	, m
	7440-47-3	Chromium	0.60	u	P] ~
	7440-48-4	Cobalt	0.40	u	P	
	7440-50-8	Copper	1.1	BIJ	P	1
	7439-89-6	Iron	8.7	ا تا	l P	1
	7439-92-1	Lead	0.70	ս	l P	1
	7439-95-4	Magnesium	42900		l P]
	7439-96-5	Manganese	46.9	<u> </u>	P	<u> </u>
	7439-97-6	Mercury	·	U	cv] \
	7440-02-0	Nickel	<u> </u>	TR IU	P	[\
•	7440-09-7	Potassium	2450	12 12	\mathcal{J} P	1
	7782-49-2	Selenium	2.9	ן ט	P] ,
•	7440-22-4	Silver	0.70	U	P	ĺΚ
	7440-23-5	Sodium	24700		P	1 1/8
	7440-28-0	Thallium	2.6	ן ט	P	$1 \not\sim$
	7440-62-2	Vanadium	0.40	W lui	T P	٦, ١
	7440-66-6	Zinc	0.70	1 ILL	$\mathcal{J} \mid P$	1 %
		_				1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Color Before: (COLORLESS C	larity Before:	CLEAR	Text	ure:	
•					,	
Color After:	COLORLESS C	larity After:	CLEAR	Arti	facts:	
Comments: DIS	SSOLVED					
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						(() 10

APPENDIX C Transportation Airbill

_ WEX USA Airbill 👛 825360779079	Sender's Copy
Plision photosof per hard 91802 Sender's FedEx Account Number 2431-0147-6	4a Express Package Service Packages up to 159 lbc. Colory combined my to lide it gate seas. FedEx Priority Overnight FedEx Standard Overnight FedEx First Overnight FedEx Institutions desired. FedEx Standard Overnight Standard Overnight Standard Overnight FedEx First Overnight FedEx Standard Overnight FedEx Standard Overnight FedEx First Overnight
and Peter Bullon Phone (317) 718-3688	FedEx 20ey* Second business day FedEx Express Sever* Third business day FedEx Environmitation Rate and evaluation day Second business day
peny D & M INC	4b Express Freight Service Packages over 158 lbs. Outrey consulted my to last 4 pans area.
105 COMMERCE DR STE D 303 N Training St	FedEx 1Day Freight FedEx 30ay Freight Freight FedEx 30ay Freight FedEx 30ay Freight FedEx 30ay Freight FedEx 40ay Freight FedEx 50ay Freight
DANVILLE States IN ZP 46122	5 Packaging FedEx Envelope/Letter* FedEx Pak* Other Pkg.
r Intermal Billing Reference "304"	6 Special Handling Include FodEx address on Section 3
10 pinents R. Romad 1 Phone (800) 833 5097	SATURDAY Delivery RESTRECTIONS RESTRECTIONS Available only for Folds: Printing Descript of Folds: Down Descript of Folds: Dow Descript to adent ZDF codes Does this shipmant contains desgarrous goods? HOLD Weekslay At Folds: Location RESTRECTIONS Not available volum Folds: The Oversight on Folds: ZDey Does this shipmant contains designation goods?
Conpuchen	No Yes Declaration Dry Ice Dry Ice Bright's Declaration Dry Ice Bright's Declaration
TEE 501 Madison AW We cannot defer to Fit beass or Fit III beas or Fit III beas or Fit III beas or Fit III beas or Fit III be	Despires Deciderates
Dept. Proof Solar France	13558492-3' a
Cary Sure NC ZP 27513	Total Packages Total Weight Total Declared Value*
S. a bask to a discount of the state of the	** Dur lability is limited to \$100 unless you declars a higher value. See back for details.
See back for application instructions Questions? Visit our Web site at www.fedex.com	8 Release Signature Synthesis askey where askey private.
or call 1-800-Go-FedEx* (800)463-3339. By using this Airbill you agree to the service conditions on the back of this Airbill and in our current Service Guide, including terms that limit our febility O165Q4	By agring you surfronze us to deliver this shopmant wishout obtaining a sepreture and agree to indomnity and hold us harmless from any resulting claims.